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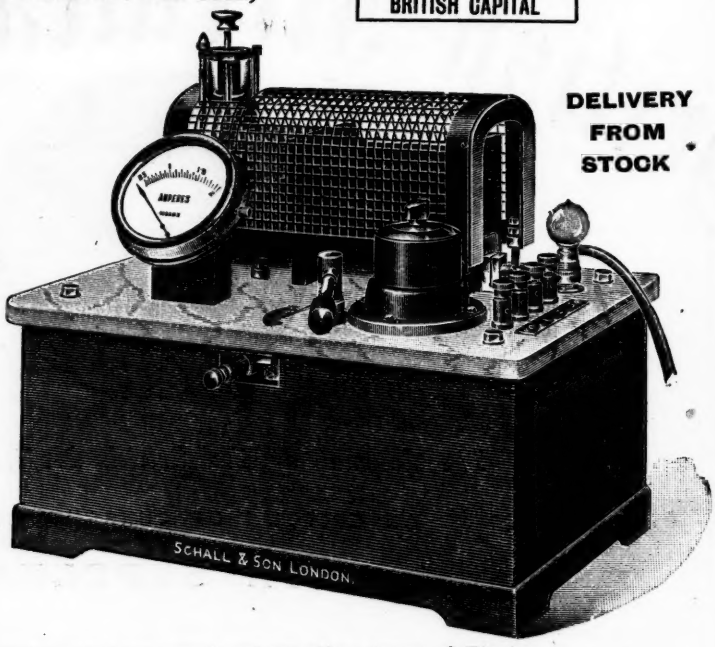

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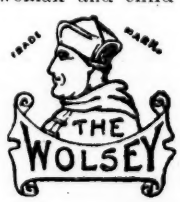

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An Address
ON
SURGERY—GOOD AND BAD.*

BY
CHARLES F. M. SAINT, C.B.E., M.D., M.S.,
F.R.C.S.,
PROFESSOR OF SURGERY, UNIVERSITY OF CAPETOWN, SOUTH AFRICA.

I AM deeply sensible of the great honour done me in electing me to the new Chair of Surgery in this university. It is not given to everyone to participate in the inception and development of a new University Medical School, and such a position carries with it great responsibility but equally great interest.

In the teaching of surgery the personal factor plays a prominent part, and the type of teaching reflects the line of thought of the teacher. It has been my good fortune for several years past to sit at the feet of one of the greatest exponents of the art in the United Kingdom—I refer to Professor Rutherford Morison of my late university. His chief object was always to inculcate general principles as far as possible and to apply them whenever it could be done. The result was a reduction of surgery to a simplicity and comprehension not commonly seen, and a correspondingly rapid acquisition of a practical knowledge of it.

Such an occasion as this appears to me most opportune to give some indication, necessarily limited, of the line along which the subject will be taught in this school. The disciple is not always a replica of the master, and while one may describe the teaching as Morisonian, it will be readily appreciated that it will be so as interpreted by me.

The subject chosen by me for this address is "Surgery—Good and Bad," and the chief point in it is the position of operative interference in surgery. It is roughly divided into two parts; the first a more or less technical exposition, and the second the deductions to be made from it.

It is a great pleasure and honour to have Sir John Bland-Sutton present here this evening. His world-wide fame precludes the necessity of any introductory remarks about him; but it is a very happy coincidence that he should arrive in Capetown at this particular time, seeing that he was one of the committee of eminent surgeons who elected me to this chair and was the last of them I saw before leaving England. I must say that he was very enthusiastic about the post and optimistic about the future of the school.

There is a popular belief that the terms "surgery" and "operation" are synonymous, and one is quite accustomed to hear the platitude that the "surgeon is the man who is always cutting people up." This erroneous conception of the surgeon and his work ought to be dispelled, and the people to dispel it should be the surgeons themselves.

The primary object of the surgeon is not "operation," but the cure of the individual by whatever means are at his disposal, and in so far as operative interference may be necessary in bringing about that cure, it plays its part in surgery. What its exact position is, however, can only be shown by a consideration of surgical principles.

The study of disease in all its aspects, using the term in its widest sense, is the work of both physician and surgeon, and its subdivision into medicine and surgery is for the most part arbitrary. Under the heading "Medicine" are commonly grouped those diseases in which operative interference is not necessary or is not likely to be so, while under "Surgery," on the other hand, are included those in which such interference will be or is likely to be necessary. At the same time, it will be readily appreciated that there is a great deal of overlapping, and many so-called medical diseases may develop conditions requiring surgical interference, whereas, similarly, many surgical diseases present medical aspects or complications.

All disease, whether medical or surgical, has a cause, although it is not always obvious and in many cases is unknown. The causes of disease are those influences which produce in the individual a departure from the normal. They are commonly known as irritants, and are subdivided into two classes:

1. *Non-infective*, including mechanical, electrical, chemical, and thermal agents, *x* rays, etc., and
2. *Infective*, the chief being the micro-organisms.

The consideration of the various phenomena arising out of the relationships of the irritants to the individual constitutes the subject of irritation. Always keeping in mind the presence of a cause, the subject of irritation may be regarded, pathologically, from three points of view: (1) Its effects; (2) the reaction of the individual to it; and (3) its complications.

In teaching one has been accustomed to subdivide the body, for purposes of generalization, into three main sections:

1. *The Composite Tissues*, including the connective tissue, vessels, nerves, lymphatics, etc., of the part.
2. *The Hollow Muscular Systems*, comprising the alimentary, vascular, respiratory, and genito-urinary systems.
3. *The Serous Cavities*, including the peritoneal, pleural, pericardial and cerebro-spinal, the tunica vaginalis, and the synovial membranes of joints, tendon sheaths, and bursae.

Let us consider, then, for a moment the pathology of irritation in its relation to the composite tissues.

1. *Its Effects.*—The effects, which are essentially destructive, are found in all degrees of seriousness. They comprise *Injury*, and are divisible into general and local. The general effect on the individual is that depression of vitality which is called *Shock*, whereas the local effects depend on the structure and the function of the part affected. The most important point in the structure is that of vascularity, and the correspondingly important effect resulting from injury to vessels is that of *Haemorrhage*. The variation in the functional derangement requires no elaboration, as it tends to be special to the tissue involved. The local effects may be grouped together and constitute a "*Wound*," though this gives a much wider significance to the term than is customary, and includes "destruction of any tissue, of any degree, in any situation, and by any irritant, non-infective or infective." Whether the skin is involved or not, whether soft or hard tissues, and whether it is produced by violence or any other agent, is immaterial.

2. *The Reaction to it.*—In considering the reaction we have to deal with two separate factors: (1) the irritant itself, and (2) its effects. Whether the reaction be to either or both of these, the main part of it is essentially the same, and consists of vascular and cellular changes. It is known as *Inflammation*, and may be either acute or chronic. In acute inflammation the vascular changes predominate, while in the chronic variety the cellular changes are the most pronounced feature (Rutherford Morison). When the reaction is limited to the effects—that is, to the destruction produced—it constitutes *Repair*. The much vexed question of tumour formation is too uncertain and involved to be introduced in this address, though I have little doubt that in due course it will be shown to be simply one of the manifestations of tissue reaction to irritation.

3. *The Complications.*—As a wide generalization, one may say that the complications of irritation depend upon increase of the irritation, either from exaggeration or extension of the original irritation, or from some other superadded. For practical purposes they may be classified as arising from (1) extension of the original process; (2) secondary infection, especially sepsis; (3) healing, partial or complete—that is, where resolution or perfect healing has not occurred; cure usually takes place by fibrous tissue development, the commonest example of which is a scar.

Self-suggested by this consideration of irritation in its relation to the composite tissues, the general principles of treatment obtrude themselves; they are: (1) Remove the cause; (2) combat the effects; (3) assist the reaction; and (4) prevent complications. Should, however, complications have already arisen, it will be necessary to deal with them.

In our application of these principles we closely follow the indications given us by Nature in her healing efforts, and the subject of "natural cures" is overflowing with interest and instruction for the inquirer. I cannot hope to deal completely with this aspect of disease, but regarding it, as I do, to be the foundation on which we build, I must consider it in some measure.

* Being the inaugural address for the new Chair of Surgery in the University of Capetown, South Africa. Delivered August 24th, 1920.

Natural Cure.

By "natural cure" one understands the active attempts of Nature to overcome disease, and whatever reaction takes place is, in essence, beneficial to the organism as a whole and curative locally. We meet with all degrees in what is actually attained in this natural curative process. Thus the result may be entirely constructive both locally and generally, which is, of course, the best that can possibly be obtained. Locally, however, the cure may involve some destruction of tissue, while, from the general body outlook, the process is constructive. Again, the local result may be in the main constructive, but nevertheless produce impairment or destruction of the general body function. Finally, the result obtained may be in great part or wholly destructive both locally and generally, leading, at the best, to a state of chronic invalidism.

It is obvious that the result depends on the efficiency of the natural reaction and the nature of the pathological condition to be dealt with, and that, while Nature's intentions are always of the very best, the curative process is often imperfect, and her attainment frequently falls short of her aim. In spite of the fact, therefore, that it may appear to be presumptuous to think of improving on Nature, nevertheless this imperfection on her part is one of the strongest pleas for surgical interference, and, while she is generally looked upon as a good physician, she frequently stands self-condemned as a bad surgeon. However, I shall endeavour to show, in some measure, to what degree we are indebted to her for indications in treatment.

Acute inflammation is the commonest natural curative process met with, and is therefore that to which we naturally turn. It represents the reaction of the tissues to irritation, and though the cause of it may be any irritant, the infective type is most frequently found, usually the pyogenic micro-organisms. The inflammatory reaction presents both general and local manifestations, the general comprising inflammatory fever, and the local giving rise to a series of symptoms and signs which have been familiar to clinicians for centuries, and consisting of redness, swelling, heat and pain, and impaired or arrested function. They are due to the local increase of vascularity and the exudation of fluid.

A. *General Reaction: Inflammatory Fever.*

Clinically, the chief features of inflammatory fever are:

1. *Impairment of all the organic functions*, muscular, nervous, secretory and excretory, giving rise to prostration, indigestion, loss of appetite, constipation, diminished excretion of urine, and hot, dry skin.

2. *Excessive Evaporation from the Skin.*—This results from the raised temperature, and leads to great thirst.

Pathologically, the essential features are:

1. *Increased metabolism*, with the formation of specific antibacterial and antitoxic substances.

2. *Leucocytosis*, which is not constant, but present in the commoner infections, and of great value for defensive and offensive purposes.

B. *Local Reaction.*

Clinically, the most important features are:

1. *Impaired function*, with restricted local activity. This is due chiefly to pain, but may also depend on mechanical effects the result of exudate.

2. *Pain.* This may present any degree of severity, is due to increased tension in the affected part, and is of chief importance as being mainly instrumental in controlling the local activities.

Pathologically, the most important features depend upon:

1. *The increased vascularity and local cellular activity;* and
2. *The modes of removal of the products of the process.*

1. This includes the whole of the actual local reaction.

(*a*) *Leucocytes* are greatly increased in numbers, with the result that phagocytosis is marked, and specific antibacterial and antitoxic bodies are produced.

(*b*) *Fluid exudation* takes place in greater or less amount, and represents a mechanism for diluting the toxins, and even washing out of an open wound both the organisms and their products, and also for bringing into contact with the organisms a greater amount of the antibacterial substances present in the blood.

(*c*) *Increased cellular activity* is of very great importance, and has for its objects: (1) Phagocytosis, both by the leucocytes and the endothelial cells of the part; (2) extracellular antibacterial action; and (3) repair of the damage to the part.

2. This comprises the results of the local reaction—that is to say, the terminations of inflammation, which are resolution, fibrosis, partial and total destruction, and are controlled by the degree of interference with the vascular supply.

(*a*) When *resolution* occurs, the causal agent has been successfully dealt with and the whole of the products of the local disturbance have been removed by the lymphatics or blood stream. Repair is perfect, and the affected tissue presents ultimately no difference from the normal. When resolution does not occur, then one of the remaining terminations of inflammation necessarily results.

(*b*) By *fibrosis* the focus may be completely delimited, and, though the causal factor may not be entirely destroyed, it may be rendered innocuous by encapsulation. In such cases, therefore, the products of the process may not be entirely eliminated.

(*c*) *and* (*d*) In *partial and total destruction* there is an attempt to get rid of a more severe infection, not by destroying it and absorbing the products as above, but by casting off the affected tissue with the infecting organisms present in it. It is employed because milder measures have been judged insufficient. In partial destruction this is brought about by a molecular or particulate destruction, such as is seen in ulceration, caries, and abscess formation. In the latter case, once pus has formed, there is a general tendency for it to track along the line of least resistance towards the surface, where an opening is established and its discharge effected. In total destruction, on the other hand, the process is one of molar or massive destruction, such as is seen in gangrene and necrosis. In this event, a large mass of tissue is separated at one time.

TREATMENT.

Following the lead given by Nature as detailed above, the treatment indicated in such an infection, where the tissue reaction is inflammatory, is as follows:

A. *General Treatment.*

1. *The impairment of all the organic functions*, whereby they are suspended in greater or less degree, as shown by the prostration, inability to digest food, etc., indicates prescribing *rest* to all the body activities, whether physical or chemical. (*a*) Physical rest is best attained by confining the patient to bed in the recumbent posture, which attitude he usually adopts naturally. (*b*) Seeing that the secretory and excretory functions are essential to life, and must therefore be continued, the body is best served and they obtain the greatest relief by rendering them as far as possible passive—that is to say, a maximum of efficiency is aimed at with a minimum of expenditure of energy. This is obtained as follows:

The digestive impairment is best aided by the administration of a stimulating, easily assimilated fluid diet.

The intestinal impairment is controlled by saline purges.

The renal impairment is assisted by the administration of quantities of bland fluids.

The skin activities are helped by hot bathing, and the lungs are assisted in their function by allowing the patient all the fresh air possible.

2. *The excessive loss of fluid from the skin* leads to the great thirst which indicates the administration of quantities of fluid. According to circumstances, this may be given by the mouth, by the rectum, subcutaneously or intravenously.

3. *The increased metabolism* and the formation of antibacterial and antitoxic substances gives the lead for the administration of (*a*) antibacterial and antitoxic serums, preferably monotypical; (*b*) vaccines, preferably autogenous; and also (*c*) chemical substances, which may or may not be specific—for example, salvarsan, emetine, the numerous antiseptics, etc.

4. *The presence of leucocytosis* has been imitated by the administration or injection of such substances as quinine or turpentine, with beneficial effects.

It is important to keep in mind that where the fever is excessive it may have a pernicious effect on the individual, and in such a case must be controlled, for example, by cold sponges or antipyretics.

B. *Local Treatment.*

1. *The impaired function*, with restricted local activity, suggests local rest or immobilization, which is obtained by a variety of fixation apparatus, or splints if necessary.

2. *Pain* may be relieved by elevation of the affected part, indicated by the fact that increase of pain usually follows the dependent position, and the patient himself commonly keeps the part raised.

3. *The increased vascularity and local cellular activity*, which represent the natural reaction, suggest that treatment should take the line of increasing or assisting this reaction, and this may be done by (*a*) the application of moist heat—that is, by fomentations or poultices—or (*b*) by the so-called Bier's passive congestion, by means of an elastic bandage or some form of cupping-glass. The elastic bandage also relieves the pain, and this form of treatment is frequently seen naturally, when a patient with an inflamed finger grips or ties something round the base of that finger to relieve the pain in it.

4. *The natural modes of removal of the products of the process* give several suggestions as to treatment, used chiefly as aids to the natural methods of removal, but sometimes forestalling them.

In *resolution*, where the absorption of the products by the lymphatics and blood stream takes place, this is aided by elevation of the part, which assists drainage.

Fibrosis, with the resulting encapsulation or delimitation of the focus of disease, is not imitated in the treatment of these septic infections, but is quite frequently employed in malignant disease, where, by means of *x* rays, radium or electricity, the development of fibrous tissue is aimed at, with a view to limiting the spread or strangling the elements of the disease.

In partial destruction a further effort on Nature's part has been seen—namely, to get rid of the disease by a process of ulceration or the formation of an abscess and its subsequent discharge. These suggest two very common surgical procedures, incision and scraping.

Incision mimics the bursting of an abscess, and is usually employed to forestall it. It allows of external drainage of pus or other products instead of their removal by the lymph and blood streams, and thereby relieves the system of a considerable quantity of toxic material. It is also employed to relieve tension, and consequently pain, and so diminish the dangers arising from vascular interference. This, however, is not comparable to the other indications for it, as it represents one of those cases in which the surgeon is called in to correct an error of judgement of Nature.

Scraping imitates the process of ulceration, and is frequently employed to assist in getting rid of such material as Nature is already occupied in removing. It is more commonly employed in chronic conditions rather than in acute ones.

Finally, *total destruction*, or the casting off of a focus of disease in bulk, as seen in gangrene or necrosis, suggests the removal of such a focus of disease by excision or, in the case of the limbs, by amputation.

We have here, then, an example of the complete analogy between Nature's line of treatment and that adopted by the surgeon, which may be described as good and sound.

Arising from a consideration of the above facts, several important and interesting points suggest themselves. The first is that we are here dealing with an ideal case—that is, one in which the etiology, pathology, diagnosis, and prognosis are completely known and understood, and the treatment, as indicated by Nature, follows automatically. The second is that Nature herself employs, and indicates the employment of, what we may call both "medical" and "surgical" measures—that is, those to which non-operative and operative procedures are analogous. Thirdly, no doubt is possible as to the position allocated to the natural "operative" measures. They come as a last resort, after all other means have failed, and tissue, representing a focus of disease, is only cast off because it is impossible to save it.

The first of these points opens up the whole subject of the relationship of the science to the art of surgery, or, to put it in another way, the question of surgical judgement and its relation to treatment, especially operative.

Good judgement depends on an intimate knowledge of disease in all its aspects, its causation, its development, the natural reaction to it, and the final results which accrue. The better this knowledge the better the judgement is likely to be. It involves the questions of diagnosis and prognosis, and on these the line of treatment to be advocated follows of necessity. If a choice were to be made between a surgeon of superior judgement and one who was only a good operator, the balance would be very markedly in favour of the former. In the absence of good judgement, therefore, with its entailed good diagnosis and prognosis, good treatment cannot be systematically carried out. Good diagnosis carries with it a clear knowledge of the pathological process present and the various means of treatment available, whereas good prognosis, with a perfect understanding of the eventualities, leads to the selection of the best line of treatment for the particular case in question.

The importance of diagnosis cannot be exaggerated, and while in many cases it is obvious, in some it is quite the reverse, and in these every possible means ought to be employed to allow of its elucidation before treatment is adopted. Dr. William Mayo has said, "You cannot always make a diagnosis, but it's a mighty good thing to try," and this is the attitude which a good surgeon will adopt. One must acknowledge, therefore, that a diagnosis is not always possible, and an operation of an exploratory nature may be necessary to dispel doubts and allow of one being made. Further, the diagnosis is sometimes wrong, indeed the correct one is not always the best (according to the various symptoms and signs present), which anomaly is to a great extent explained by the fact that the human being is not a system of rigid tubes and blocks of inert material, such as a plumber has to deal with, and the personal factor often plays a large, and perhaps misleading, part in the investigation of disease. However, the better the surgeon from the point of view of judgement, the fewer will be the cases in which absence or error of diagnosis will occur, and the fewer will be the corresponding exploratory operations. One need hardly say that the only man who never makes a mistake in diagnosis is he who never makes a diagnosis at all.

Good prognosis depends upon a sound knowledge of pathology and a wide experience of cases, and from a practical point of view its chief bearing on treatment depends upon the assessing of the probabilities of the success or failure of the natural and non-operative or "medical" measures. Should judgement be given against the likelihood of their success, then, if cure is to be obtained, the advocacy of operation follows as a matter of course. In such an event the earlier it is done the better, and so in these cases operative treatment will usually forestall and often completely replace any other.

It has already been pointed out that Nature, in dealing with disease, employs both non-operative and operative measures, and that the latter are only used as a last resort, when the former have failed. But operation, in surgical treatment, occupies the same relative position as in Nature's treatment—that is, it is a last resort, with the reservation, already made above, that, where judgement foreshadows the failure of other measures, such a failure is not waited for, but operation is advised and performed as early as possible. The indications for operative interference may thus be reduced to two—namely, (1) failure of the natural cure, and (2) failure to cure by medical means. It is therefore a truism to say that the degree of success attending surgical operation in disease is the gauge

of the limitation and failure of medicine in its treatment. Hence, from the operator's point of view, true advance in the surgical treatment of disease must lead to what may be best described as "surgical suicide," seeing that, as specific therapy and preventive medicine in one or other form progress, the necessity for operative interference must steadily diminish until finally one sees it limited to the treatment of accidental injuries and mechanical defects.

In an ideal scheme, then, for the treatment of disease, operative measures have no place, and the best surgery is that which approaches most closely to the ideal. Unfortunately, the present imperfect state of our knowledge of disease, and our consequent limitations so far as ideal treatment is concerned, leave open a wide field in which operative interference offers the best hope of cure to the patient. However, this interference is minimized by the surgeon of good judgement as unnecessary, and futile operations will be avoided. The failure of the natural and medical means of treatment has been postulated as the indication for operative interference, and it is just here where good judgement appears at its best. For whether or not operative measures will be necessary, what they shall be if they should be called for, and when the most opportune time will be for utilizing them, are questions which depend entirely on the adjudged efficiency or futility of the non-operative treatment.

Should operative interference be considered advisable or necessary, the next question to be settled is, "What is the operation to be?" There can be no diversity of opinion that the best operation is that which offers the maximum of benefit with the minimum of interference, so that if some simple and conservative procedure be efficient to deal with the condition present, it is bad surgery to employ a complicated and destructive one; and, generally speaking, one might add that the efficiency varies directly as the simplicity, or inversely as the complexity, of the technique. The carrying out of such a principle, too, militates against the indiscriminate, casual, and unnecessary removal of tissue which might easily be preserved, often with benefit to the patient; this is strongly indicated by Nature, for it has already been pointed out that she casts off tissue only because she is unable to conserve it. The settling of this question also depends on good surgical judgement.

Bad judgement, then, which is due to ignorance of the normal and diseased states of the individual, and on lack of the power of correlation and deduction, is responsible for bad surgery, of which we have evidence in three main issues: (1) The withholding of operations which are necessary or advisable; (2) the performance of unnecessary and superfluous operations; and (3) the performance of inefficient, imperfect, or wrongly chosen operations.

The withholding of necessary or advisable operations is quite as much a mark of bad surgery as excessive operating, the performing of operations which are unsuited for the condition present, or of those which are not thorough or are technically wrong. No doubt one of the chief causes of unnecessary and meddlesome operative interference is the comparative ease and safety with which the ordinary operations of surgery may be embarked upon, granted an averagely good aseptic or antiseptic technique. The results of such bad surgery are not always obvious, thanks to the intervention of one or more of several agencies, and in this respect the *vis medicatrix naturae* plays a prominent part. It is invariably of the greatest assistance to good and is often the salvation of bad surgery.

In counteracting, and so covering up, the results of bad surgery, one example of Nature's foresight is the provision of a reserve, both physical and functional, by which the removal of a limited amount of tissue or the interference with function to a certain degree may be borne without any deleterious result. Where more than constitutes the reserve is put out of action, Nature's compensatory mechanism, involving the hypertrophy and increased function of what remains, may soon adjust the deficiency.

Where the local compensatory mechanism is unable to deal with the situation, one sees Nature quite often employing collateral or associated means of overcoming it. Finally, there is still the whole of the natural reaction to irritants and their effects which has been outlined above, and which is so important in dealing with what injury and infection there may arise.

Acknowledging, therefore, the wonderful compensatory, accommodating, and reconstructive power of Nature, all that may be needed to complete her concealment of bad work is that she be allowed to perform her task *in camera*, and this is readily provided for by means of the closed wound. It might be said without fear of contradiction that "the closed abdomen covers a multitude of sins."

Indications for Operation.

The general principles of treatment have already been mentioned, and are: (1) Remove the cause; (2) combat the effects; (3) assist the reaction; and (4) prevent complications. The indications for operative interference have been reduced to two—namely, failure of the natural or of medical means of cure. It therefore follows that whenever in any of the principles of treatment enumerated the natural or medical means fail, operative interference may be advisable or necessary. As a practical interpretation of this, by taking the principles *seriatim*, the chief indications for operation are as follows:

1. *Remove the Cause.*—The chief requiring surgical removal are *foreign bodies*, especially septic ones. Micro-organisms may occasionally be removed by mechanical and chemical means, but usually their removal necessitates the simultaneous removal of the tissue they are present in, and the procedure does not therefore come into this category.

2. *Combat the Effects.*—The common indications for interference here are to (1) arrest haemorrhage; (2) close a wound; and (3) restore function—for example, plating a fracture, suturing a nerve, etc.

3. *Assist the Reaction.*—Here, as a last resort where non-operative measures had failed, operative interference has been shown to be indicated, by (1) incision, to allow of external drainage; and (2) scraping, excision, or amputation, in order to remove a focus of disease.

4. *Prevent Complications.*—These arise from (*a*) extension—for example, fractured ends of bone pressing on nerves, vessels, etc., or conditions requiring ligature of a vein proximally, to prevent discharge of emboli into the circulation; (*b*) secondary infection, especially sepsis—for example, in a compound fracture, psoas abscess, etc.; (*c*) healing—for example, from fibrous tissue formation and its contraction, the mechanical effects of excessive callus formation, etc.

Mention has been made of operative interference being indicated for diagnostic purposes; it may be quite a valid proceeding, but it should be reduced to a minimum. This has perhaps a special bearing in a country such as South Africa, where cases are treated at great distances and medical aid is difficult to obtain. In such cases, where the means for detailed diagnosis are not available and doubts exist, the balance is greatly in favour of operating, as much the safer course. This bears out the generally recognized claim that, as far as possible, all cases should be treated in a properly equipped hospital, where complete investigation can be made, and where the patient has the best chance of being cured by other than operative means.

Much might have been said, in considering such a subject, on the advantages to be gained from a careful choice of anaesthetic, the employment of measures against shock, and the technique of operating, etc., but these would have required too much time, and have purposely been omitted.

What I hope to have been able to show, then, is that operation is not synonymous with surgery, that it is not the primary object of surgery, and that it is not even the first pillar of treatment on which the surgeon leans for support. On the other hand, with few exceptions, operative interference is employed because of the failure, or probability of failure, of other means of cure, whether of those utilized by Nature or of those non-operative measures which are commonly included under the term "medical treatment." Seeing, therefore, that the foundation on which operative treatment rests is constituted by the shortcomings of Nature and of medicine, true advance in the treatment of disease must lead to the progressive diminution in the number of operations and the gradual disappearance of the operating surgeon, except in such conditions as accidental injuries and mechanical defects. Under such conditions medicine must temporarily find an increasing sphere of activity and importance, thanks

almost entirely to the investigations of the laboratory worker; but as preventive medicine progresses towards the ideal, the physician, too, as accepted at present, must lose his material in an increasing degree and tend to disappear.

Pending the realization of this visionary ideal, however, the burden of our present imperfections has to be borne, and a very prominent part in the treatment of disease must continue to be played by surgery, the basis of which consists of:

1. *Good judgement*, with all it involves—of paramount importance; and, depending on this—
2. *Rational treatment*, non-operative or operative, as already described.

When operative measures are indicated, then the outstanding features of good work are:

(*a*) *Conservatism consistent with efficiency;*
(*b*) *Simplicity of technique;* and
(*c*) *Operative skill*, which includes gentleness, manipulative dexterity, and careful speed.

EIGHTY-EIGHTH ANNUAL MEETING
OF THE
British Medical Association.
Held at Cambridge, June 30th to July 2nd.

PROCEEDINGS OF SECTIONS.

SECTION OF PATHOLOGY AND BACTERIOLOGY.

Professor J. LORRAIN SMITH, M.D., F.R.S., President.

DISCUSSION ON THE PRESENT POSITION OF CANCER RESEARCH.

OPENING PAPER
BY
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CANCER research, the knight-errantry of medicine, presents "a restless complication of bold hazards and miserable disappointments." Formal tournaments and solitary encounters are the portion of its devotees to an extent unusual in other branches of scientific medicine, nor are the strong enchantments of its extinct prototype without their parallel. Strange remedies, potent as the balsam of Fierabras and as capricious, play their part and disappear. The medical and lay public contemplate with bored impatience the enigmatical actions of the combatants who, if they have their feet on solid earth, seem to have their heads in the clouds. Not a little of this want of comprehension is due to the conviction, almost universal among laymen and not unknown in the ranks of medicine, that knowing how to spell the word they know what cancer is. A natural impatience is felt, and sometimes expressed, at the apparently fictitious difficulties of definition which beset the investigator.

Two examples of these differences may be cited. In the first, in my opinion, the lay impatience is largely justified; in the second, not. In the first place, then, the nomenclature and classification of tumours seem to the outsider an unnecessary refinement absorbing far too much space in the publications on cancer. The excessively detailed systems of classification of tumours which have been proposed from time to time have no analogy with the natural classifications of animals and plants but are merely convenient aids to memory. This is at once seen to be so if we reflect that the new growths of men and animals are really new formations arising afresh from the non-neoplastic elements of the organism attacked. The basis of a natural classification—community of descent—is therefore absent, so that it is only metaphorically that it can be said that one tumour-form is derived from another. The derivation is from the normal mother tissues, but even a histogenetic classification, if too rigid, may be misleading. The human importance and the intellectual fascination of the subject compel the detailed analysis of all the cognate material, but the systems of nomenclature and classification can only be judged by their concise descriptiveness and convenience.

The second example of difference of standpoint is seen in the attitude of the research worker to reports in the lay and medical press of the cure of cancer. His first scrutiny is directed to the evidence that the patient really was the subject of cancer, and there must be few of any experience whose inquisitiveness in this direction has not been regarded as impertinent. Clinical history, the opinion of the medical attendants, and the report of an experienced pathologist when available, must all be passed in review. One desires to examine afresh the histological preparations if these can be had. If, as sometimes happens, doubt is thrown on the histological diagnosis, this is taken as an aspersion on the competence of the pathologist making the report, or as a disingenuous attempt to discredit a great discovery. It is neither. The standard by which a tumour-like new formation is judged must be different in the two cases. A pathologist to whom a specimen from an exploratory or primary operation is submitted must weight the evidence to the side demanded by the patient's interest. It is obviously, for the patient, less dangerous to recommend that a growth of doubtful malignancy be treated as cancerous than to take a chance on the portions not examined being more innocent than those which have been seen. Let us suppose the patient has been freed from his disease. The pathologist's opinion of the sections has now little interest for the patient, but may be critical for the welfare of thousands of sufferers. He must now weight the scales against the malignancy of the specimen and demand the most stringent proof. Reasonably satisfied in this preliminary inquiry, it is then proper to consider the evidence that a cure has been effected. When stated in this way this line of argument will probably appear quite reasonable, but it has been found singularly unsatisfying to the impatience of those who believe themselves on the track of a specific for cancer.

Considerations of the same kind are similarly in place when claims are made to have effected a cure of a propagated tumour in experimental animals. In fact, it is fairly strong evidence of the close parallelism of the transplantable tumours to naturally occurring cancer that none of the numerous claims to a successful specific therapy of them has been substantiated.

The experiments now being carried out by many workers on the production of cancer, call for a discussion of the criteria which ought to be exacted in work of this kind, before accepting the new formations produced as truly cancerous. It is as well to recognize at the outset that the definitions of cancer are still essentially clinical. Their progressive character is the most constant and abiding characteristic of the malignant new formations. Local infiltration, metastasis formation, and recurrence, are, to a large extent, dependent on local conditions which may easily be incompatible with the conditions of the experiments. Successful transplantation to normal animals of the same species is more and more being invoked as the only valid proof of malignancy, and this condition was accepted and fulfilled by the late Dr. Clunet in his classical experiments on the production of sarcoma in rats after severe *x*-ray dermatitis. This condition is probably too exacting, as there are now many instances on record in which new growths in mice have failed to grow in normal animals, even when hundreds have been inoculated. Artificial metastasis by autologous grafting in the primarily affected animal is in my opinion a more just test. It has also the advantage that it not only does not exclude transplantation to normal animals but makes it possible in many cases in which ulceration and infection of the greater part of the primary growth almost preclude success.

The necessity for secondary confirmatory experiments of some kind is well shown by a remark in Yamagiwa and Ischikawa's valuable monograph on epithelial tumours produced in the rabbit's ear by painting with tar. The authors record their astonishment that some of the tumours disappeared when the irritation of tar-painting was interrupted! The absence of evidence of this sort detracts from the value of Lazarus-Barlow's observations on the

epithelial proliferations produced by radium, and of the earlier experiments of Fibiger on the production of tumours in the stomachs of rats infected with *Spiroptera neoplastica*. In his most recent publication Fibiger records successful transplantation in normal animals of these experimental new growths.

All these experiments, valuable as they are, fall short of the requirements of the cancer worker on the track of the etiology of the disease in that only a small percentage of the treated animals develop anything which can be regarded as reasonably resembling cancer, and that only after a considerable time interval in most cases. Until these shortcomings are remedied it will be futile to attempt the cytological and biological analysis of the changes leading up to malignant new growth on this material.

Before leaving this line of work attention may be drawn to the bearing of the results on the important statistical character of cancer, its increasing frequency with advancing age in man and animals. It is not easy to say to what extent this peculiar age-incidence is a consequence of the chronicity of the forms of irritation which most constantly lead to the development of cancer, and how far senile cellular changes are a necessary antecedent. The results of the culture of normal tissues *in vitro*, showing practically unlimited powers of growth under suitable conditions, would appear to relegate the senile failure of growth to the position of a secondary consequence of accidental cell damage inseparable from the chances of life. If this be so, then the age-incidence of cancer can be regarded as a consequence of the relative inefficiency of most of the forms of irritation associated with the origin of cancer in producing the disease. In support of this way of looking at things, it may be noted that L. N. Dublin records a higher incidence of cancer in the experience of the New York Equitable Insurance Company in industrial policy holders than in those in easier social circumstances. The former are of necessity more exposed to various forms of chronic irritation than the latter. Fibiger has developed the same argument in reply to the objections raised to the cancerous nature of the growths in rats' stomachs, namely, that they are not necessarily associated with old age. He claims that the spiroptera infection is so potent a cause of the disease that the long duration necessary with other forms of irritation is not required.

The low percentage of experimental animals in which the cancerous change can be induced still requires explanation. It is possible to assume that in this respect the short duration of life of the mouse and rat is a drawback, and that given a sufficiently prolonged irritation the majority would succumb to the disease. Natural predisposition would have to be invoked to account for the more rapid onset in the individuals which become cancerous in the experiments as at present devised. We have in the hereditary increased liability which has been demonstrated in stocks of cancerous parentage a considerable ground for assuming the necessary predisposition, and it remains to be tested whether mice of cancerous stocks are more easily made the subjects of primary induced cancer than others.

The achievement of experimental cancer research in the period 1900–1914 which raised the greatest hopes and most strongly attracted the energies of workers was undoubtedly the discovery by Jensen of an acquired resistance to grafted cancer following an unsuccessful inoculation. It appeared as if here was to be found the basis of a rational treatment of cancer. The observations of Haaland and Russell practically destroyed this hope. Haaland showed that the most intensive preliminary treatment had no inhibitory effect on autologous grafting of spontaneous carcinomata of mice, nor did it hinder in the least recurrence and metastasis formation. Russell's experimental analysis of the process on transplanted tumours demonstrated the fact that the resistant condition was only effective during a short period immediately following implantation. Animals bearing progressively growing tumours could be rendered resistant to a secondary inoculation of the same or another carcinoma without modifying in the slightest degree the progress of the established tumour. This curious discrepancy still lacks a satisfactory explanation.

The nature of the resistant or immune state is also still unexplained, and much work has been expended upon it, even after Haaland's autologous inoculation experiments had shown its futility in spontaneous cancer, the form which, as a therapeutic problem, duplicates human cancer. After Russell had shown that in resistant animals there was a failure of the fibroblastic and angioblastic reaction to implanted carcinoma, Da Fano found that the procedures which elicited the resistant state were accompanied by the appearance of plasma cells in the connective tissues throughout the body. They were absent after preliminary treatment which did not produce immunity —for example, after inoculation of killed normal tissue. J. B. Murphy in a series of papers contended that the essential factor was the production of an increase in the number of circulating lymphocytes. In conformity with this view he found that successful implantation of mouse tumours into developing hen's eggs could be prevented by a simultaneous inoculation of adult fowl spleen—an experiment which has been repeated on a large scale by Stevenson without confirmation. Similarly Bullock observed no inhibition of the growth of mouse tumours in baby rats when adult rat spleen was inoculated at the same time, either at the same site or at a distance.

On the other hand, Mottram and Russ and their collaborators found, following Murphy, that *x* radiation of rats and mice produced a lymphocytosis or a lymphopenia according to dose, and the increase in lymphocytes was accompanied by increased resistance, their diminution by diminished resistance.

So long as these observations were not extended to spontaneous tumours they were felt (by me at any rate) to bear only indirectly, or not at all, on the treatment of cancer in man. Great interest therefore attaches to the observations of the late H. D. Taylor, working in collaboration with Murphy, who found that autologous grafting failed in spontaneously affected mice if the animals were exposed to a hot dry atmosphere (60° C. for ten minutes) between the operative removal of the primary tumour and the autologous implantation. Should these observations be confirmed under rigid control they will constitute a new discovery of the first importance. Apart from severe disturbance of the general health no means has yet been found to influence the course of autologous grafts. This degree of heating trenches rather closely on the limits of survival of mice and produces a profound disturbance of the heat-regulating mechanism. It is possible that the failure of the graft, when it does occur, is due to secondary effects of the treatment other than the lymphocytosis which, according to Taylor and Murphy, is produced by it.

The lines of investigation which have been discussed so far are in the nature of more or less direct attacks on the prophylactic or therapeutic problems of cancer. For some of us the conviction is gradually gaining strength that our knowledge of the fundamental processes of cell life is not yet sufficiently advanced for the special purposes of cancer research. The cancer cell is in some way different from the cells of the same kind among which it takes its origin and from which it arises. The nature of the change is still unknown. It is probably of a thorough-going kind and in most instances of a quite surprising degree of permanence. Nothing impresses this fact more strongly on the imagination than the behaviour of the Jensen mouse carcinoma which has now been propagated continuously in normal mice for twenty years and is structurally and biologically the same as when first transferred to normal animals.

All the differences which have been found so far between cancer cells and those of adult tissues can be paralleled in rapidly growing tissues of the embryo. Cancerous tissue, for example, contains more water of imbibition than adult tissue, and the most rapidly growing tumours have the highest proportion of water to solids. In consequence some slowly growing tumours are found to be less watery than testis and embryonic tissues. The differences in this respect are therefore not absolute, so that one cannot say that no cancer has less than a certain percentage of water, and below this level are ranged all normal tissues, embryonic and adult. Cramer, who has carried out these estimations on an extensive scale, has also shown that an artificial reduction of the water of imbibition (induced by exposure of tumour emulsions to isotonic solutions of calcium salts) cuts down the rate of growth and percentage of takes on transplantation. The effect can be abolished and the yield restored by washing the treated emulsions free of calcium in normal salt solution. The action of calcium is therefore not a simple lethal one, but a reversible interference with the physico-chemical mechanism of growth.

Drew's experiments on the relative oxygen avidity of normal and tumour cells show that the calcium effect may in part be due to disturbance of the oxidation processes. The decolorization of methylene blue solution or the reduction of oxyhaemoglobin by intact cells *in vitro*, is reduced to a very low level by previous exposure to isotonic solutions of ionizable calcium salts. Just as in the transplantation experiments of Cramer, this action also can be reversed by washing in normal salt solution. The low oxygen avidity found for tumour cells by this method is usual in rapidly growing normal tissues, but the highly differentiated sluggish tumours in our material are not characterized by a correspondingly high oxygen avidity.

The elaborate and painstaking investigations of Drummond on the composition of tumour and normal proteins show a close correspondence amounting to identity between the two. His investigation of the effect of restricted dietaries reveals a corresponding dependence of both on identical nutritive substances, basal and accessory, so that to influence tumour growth it is necessary to jeopardize the life of the host. In fact increasing refinement of methods and accuracy tend to emphasize the similarity of the cancer cell-metabolism to the normal cell-metabolism.

The remaining line of investigation which is being pursued at present is the study of normal and tumour cells by the method of culture outside the body. When technical improvements have increased the flexibility of this method it should provide a powerful means of attack on the fundamental problems of the disease. At present the technical difficulties make the mere achievement of maintaining tissue cultures something of a *tour de force*. Woglom has pointed out that these difficulties are more in evidence in the culture of the easily transplantable malignant new growths than of normal tissues, a discrepancy as surprising as it may be significant.

The one positive character of new growths is their progressive proliferation, uninfluenced by the forces limiting the increase of the elements of healthy or diseased tissues. The transplantable tumours of laboratory animals present this feature and its insistent problem in its purest and most clamant form. The subtlety of the cellular derangement and its close contact with the fundamental problems of biology give an atmosphere of adventure to every attempt, however indirect it may seem, which human ingenuity devises to elucidate the harmonies and contradictions which lie on every side of the problems of cancer

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It seems to me that the occurrence of carcinoma is best explained as an abortive attempt of the organism to reproduce itself asexually. If this view be correct, then the tumour must be looked upon as a bud or outgrowth from the organism itself, and the problem of how to diminish the incidence of the disease must be one of avoidance or prevention of the conditions in which its formation is likely to be induced. The epithelial cells are the least differentiated of all the cells in the body, and consequently are those which can most easily revert to the ancestral germinal type. This reversion occurs normally in cases where there is an alternation of generations, as in certain hydrozoa, where, under varying states of nutritional environment, the animal reproduces itself by budding or by the development of sexual organs. Such a reversion may occur in localized areas of the human body. Under favourable conditions there may form a colony of actively dividing individuals, each one of which is capable of leading an independent existence. This view is strongly supported by the close resemblance shown by cancer cells, in their mode of division, to the cells of the germinal epithelium. The conditions favourable to this reversion of cells to the ancestral germinal type and to their active multiplication, with the consequent formation of a colony or growth, are the following: (1) Degeneration of epithelial cells, either from an inherited tendency or from the cessation of function of the gland of which they form a part—for example, breast or uterus; (2) abundant supply of nourishment; and (3) a local irritant which, by maintaining dilatation of vessels, etc., continues to keep up the supply of nutriment to the part. The hereditary tendency to early degeneration of epithelial cells may be compared to other well known familial characters such as the precocious occurrence of white hair or the premature disappearance of subcutaneous fat. Further, the fact that these conditions, usually associated with heredity, may be produced by unfavourable environment would account for cancer houses, streets, valleys, etc. The common sites for primary cancer are the breast, the cervix uteri, and the rectum. In the breast the time of occurrence coincides with the period in which the gland is ceasing to function, the cells are degenerating, and the blood supply is in consequence unnecessarily large. If now an irritant appears, whether it be from a fissure as in "Paget's nipple" or from the presence of a parasite, the over-nutrition of the part will be maintained and there will be danger of cell reversion and multiplication, with the consequent development of cancer. Should there be also in the individual an hereditary tendency to early cell degeneration, this danger will be greatly increased. Similar arguments are applicable to the other common sites for cancer, and also serve to explain the change from benign to malignant characters so often seen in pyloric or rectal ulcers. If the predisposing causes are present, then the exciting cause may be a rough tooth, a gall stone, a fissure, the gardener's straw, the sweep's soot, or a nematode parasite; but these exciting causes really only serve to make permanent a biological process which without their aid would probably be only a passing phenomenon.

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Dr. Murray has very shrewdly touched every important aspect of the cancer problem. There is, however, one line of research of which I consider he takes an unduly despondent view—I refer to cancer resistance or immunity. I propose, therefore, to review very briefly the facts on which these contrary views are based. Considering first inoculated cancer: if a number of rats are inoculated with Jensen's sarcoma it will be observed that in some no tumour results, in others a small growth appears, which subsequently is absorbed, whilst in others large progressively growing tumours are found. Here there is every grade of resistance from the immune to the fully susceptible. Similarly, if the growth of a number of different tumours be studied every grade of virulence will be found, from one which takes in 100 per cent. to one which does not grow on inoculation. Turning now to produced cancer, a similar grading is seen: even in the most successful experiments, such as Fibiger's, only a small percentage of the animals are susceptible, in others an overgrowth occurs which is absorbed directly the exciting agent is removed, in others little or no change is observed.

Spontaneous cancer exhibits similar variation. Certain species are more susceptible than others, certain races more than others, and within the race certain families. In fact there is considerable evidence that heredity is an important factor. Further, the absorption of tumours so commonly seen in inoculated cancer is occasionally seen in spontaneous cancer. The resistance so far considered may be termed natural resistance, and like acquired and induced resistances it can be broken down by exposing the animal to *x*-radiation. For instance, a tumour of low virulence which will not grow in normal animals will grow in *x*-rayed animals, and further, mouse carcinoma will temporarily grow in *x*-rayed rats. Acquired resistance is found in animals which have absorbed an inoculated cancer, a second inoculation being invariably negative. If, however, they be exposed to *x*-radiation a tumour will result and persist until the effects of the radiation begin to be recovered from. Resistance can be induced against cancer inoculation by the inoculation of various tissues—embryo skin, spleen, blood, etc., and also by the exposure to small doses of *x* rays. This induced resistance is likewise destroyed by exposing the animal to comparatively large doses of *x* rays. It has been seen that these three kinds of resistance have some common feature. If now we study the rôle which the lymphocyte plays we can observe further similarities. Dealing first with inoculated cancer, in susceptible animals there is a decrease in the number of circulating lymphocytes, or a slight rise for a week after inoculation, and then a fall. In immune animals there is a lymphocytosis, as also there is in the artificially immunized animals. In animals bearing spontaneous tumours the lymphocytes are in normal numbers, but in

man a lymphocytosis is usually found in the early stages of the disease, but later a leucopenia occurs. Prolonged exposure to *x* rays causes a profound leucopenia, and at the same time destroys the resistant condition. On the other hand, repeated small doses of *x* rays give rise to a lymphocytosis and an increased resistance to inoculation. Broadly speaking, therefore, the resistant conditions, whether naturally acquired or induced, are associated with a lymphocytosis, and the susceptible with a leucopenia. Numbers of circulating lymphocytes are not, however, the essential factor, for rats with 200,000 lymphocytes per cubic millimetre as the result of *x*-ray treatment, or with 100,000 as the result of splenectomy, or treatment with the pilocarpidine, have grown progressive tumours. It may be mentioned that in animals exhibiting acquired or artificial immunity there is a general increase of the lymphoid tissue throughout the body, and also of the plasma cells.

Finally there is a similarity between these conditions of resistance in respect of the local accumulation of lymphocytes. In induced immunity there is a local accumulation around the inoculated substance. In acquired immunity there is a marked accumulation of lymphocytes round the tumour during its absorption. Radiated tumour cells may be used for the production of induced resistance, and here also a local accumulation of lymphocytes occurs, but if a larger dose of *x* rays be given no induced immunity results, and no local accumulation of lymphocytes occurs. In man local accumulations are often seen around small primary growths, and in spontaneous cures a lymphocytic reaction accompanied by a fibrosis is the usual histological feature. Thus a considerable similarity between these resistant states is found, but complete identity has not been established; in fact, Dr. Murray instances the experiments of Haaland, which seem to be of a negative nature. Haaland showed that the methods of producing induced resistance are not effective for an animal against its own spontaneous tumour. This negative result becomes of less importance when it is made clear that induced resistance is never able completely to protect normal animals—there is always a small percentage which are susceptible to inoculation. The fact that an animal develops spontaneous cancer is evidence of its special susceptibility to that tumour; if so, it is clear why it fails to respond to the feeble methods of protection at present available.

In face of the many features which natural and induced resistance have in common, it appears to me that Haaland's negative results by no means indicate that spontaneous cancer will not respond to a more powerful induced resistance if such can be produced. Already certain experiments of Murphy, which I understand Dr. Russ will deal with, indicate that the growth of an autologous graft can be inhibited.

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Dr. Murray has quoted the experiments of Taylor and Murphy, who showed that autologous grafting failed in spontaneously affected mice if the animal were exposed to a hot dry atmosphere between the operative removal of the primary tumour and its autologous transplantation; subject to confirmation, Dr. Murray considers this to be a new discovery of the first importance. I should like to quote an experiment made by Murphy and Morten in 1915, and to ask Dr. Murray if he does not consider it to be of equal importance to the one he quotes. These experimenters collected fifty-two mice with spontaneous tumours, removed the tumours, gave the animals a single dose of *x* rays, and re-inoculated the animals with grafts of their own tumours; the result was that one-half of the autologous grafts failed to grow; out of 29 controls, 28 autologous grafts took.

From my own point of view I should look upon such an observation, if confirmed, to be of greater significance than the one quoted by Dr. Murray; in the first place because the *x* rays produced no such alarming symptoms as were found in the mice subjected to the high temperature, and, in the second place, because it has a very obvious bearing upon the therapeutic use of *x* rays in malignant disease in man. The dose of *x* rays used by Murphy and Morten is not exactly specified, but they state that it was sufficient to exert a stimulating action upon the circulating lymphocytes. The function of the lymphocyte in the body of an immunized rat or one bearing a tumour is doubtless very little understood, but, as far as our observations go, they show in immunized animals a variation from their behaviour in normal animals. There is seen to be a marked accumulation of these cells around a graft three or four days after an inoculation into an immunized animal; but further work has shown that this process is not at all conditioned by the number of lymphocytes in the circulation. The latter may be increased to ten times the normal number with no evidence of an increased resistance on the part of the animal, whereas a rat having no more than the average number of lymphocytes may be absolutely immune to inoculations. It looks as though some mechanism is brought into play whereby the lymphocyte is brought to the neighbourhood of growing cancer cells. In some cases, however, this does not happen.

Dr. Murray insists—and indeed, if I may say so, his view-point seems largely coloured by this consideration—that the immunity of an animal towards homologous grafting is essentially different from that towards the autologous inoculation of a spontaneous tumour; whereas to attain the first is easy, that of the latter is difficult, but both of the experiments just cited show that it is apparently possible. In some of our work at the Middlesex Hospital we have adopted the view-point that these differences are differences in degree, enormously different in degree, but not in kind. Consequently we think that the animal experiments which have been planned to show the dual effects of radiation upon tumour growth and upon animal resistance may have direct application to the question of the treatment of malignant disease by such form of radiation as *x* rays or the rays from radium.

It does not seem possible at present to gauge the potentiality of these agents either in the production of an immune condition or in the complete control of tumour growth. It seems certain, however, that recognition must come of the fact that these are agents which, in the last fifteen years of their application in the treatment of malignant disease, have been of great benefit, and that the subject of radio-therapy is likely to warrant a greatly increased interest by investigators.

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The experiments with transplantable tumours of mice seemed at first to pave the way to the solution of many problems in cancer. Successful grafts could be obtained in a large proportion of cases, and one naturally turned to the means whereby the growth of these grafts could be prevented. It was found that previous inoculation with various living tissues from other mice, or the absorption of tumour tissue when the graft had failed to take, frequently protected the animals against subsequent inoculation of the tumour; and we seemed to be on the high road towards the elaboration of means of conferring immunity to tumour growth. If, for example, we inoculated tumour material into 100 mice we might find that tumours resulted in 50, whilst the others remained insusceptible; when, again, the 50 negatives were given a second inoculation of tumour tissue only 10 might develop tumours, and if we gave a third inoculation to the remainder, 4 perhaps might prove positive. It was generally concluded that we had here to deal with a condition of gradually increasing immunity, as represented by the falling percentages 50, 20, and 10; but such a reading entails an obvious fallacy, for on each occasion we are cutting out the susceptible members of the groups, and if we assume, as would seem justifiable, that those animals which were once susceptible would remain so to subsequent inoculation, we ought to record the results in rising percentages of successful inoculation, namely, 50, 60, and 64. In other words, the resistance, so far from increasing, actually diminishes as the result of repeated inoculation. I investigated this question with several different strains of tumour, giving repeated spaced inoculations to mice which had proved refractory to a first inoculation or in which the original tumour had spontaneously disappeared, and I found that the so-called immunity was exceedingly variable; some animals which were negative to as many as six or seven inoculations might later develop a tumour from subsequent

transplantations. In this respect the resistance is quite incomparable to the immunity of infective diseases. On the other hand, I found that though an animal might develop a tumour after the first inoculation, yet if that tumour were completely removed a subsequent transplantation of the same tumour strain did not necessarily give rise to a tumour. Thus the susceptibility as well as the resistance was a variable condition. Prolonged investigation of the serum of "immunized" animals failed to reveal anything resembling the known antibodies. If, for example, I took three sets of pooled serums (in order to get sufficient quantities)—namely, from tumour-bearing animals, from "immunized" animals, and from normal animals—and having mixed these with different portions of the same tumour emulsion and incubated the mixtures for varying periods of time, I inoculated the mixtures into three sets of fresh mice, I could never determine any appreciable difference in the results. Tumours resulted and grew just as well in one case as in the others. This has some critical bearing on the observations of Freund and Kaminer (on which they have built a method of sero-diagnosis) that the blood serum of normal or non-cancerous individuals contains a substance capable of disintegrating cancer cells, whilst the serum of cancer patients is devoid of such protective property. It was further shown, especially by Woglom, that whatever resistance might be induced to transplantations by the previous inoculation of living tissues, no resistance at all could be produced if the animal's own tissues were employed. Further, it was found to be impossible by any such means to protect an animal against the spontaneous development of a malignant tumour; and, finally, it was shown by Dr. Murray that an animal having once developed a spontaneous tumour, could not be protected against the autotransplantation of that tumour or the occurrence of metastases. From these and other experiments it is to be concluded that an animal does not develop an immunity to its own cells, normal or pathological. Such results have definitely closed certain avenues of hope in the treatment of the disease.

The observations made on the experimental tumours of animals have cleared our minds of many old encumbering fallacies and theories. They have taught us that, however attractive speculations may be about the origin and cause of cancer, it is idle to indulge in them. They have helped us to get rid of much useless histological classification of tumours. And they have led us to look upon the neoplastic process as a thing apart—a peculiar response, but only one of the possible responses, to widely different stimuli. Everyone who has had an extensive experience of tumours realizes how difficult, or even impossible, it is on occasion to separate simple tumours, or even hyperplasias, from malignant tumours. I need only instance the parotid mixed tumours. After all, the separation is quite artificial, and though, in the great majority of cases, the histological features enable one to place the tumour with a fair degree of certainty, yet occasionally our criteria fail us. Dr. Murray has proposed another criterion of malignancy—namely, the transplantability of the tissues. Unfortunately this is not applicable to human tumours, but even in the case of the lower animals the criterion cannot be accepted as certain. No one, I feel sure, would agree that the failure of transplantation was a proof of the innocency of the tumour. We know that many human tumours do not give rise to metastases. On the other hand we must take into account certain common features in the definitely transplantable tumours of mice: some of these spontaneous tumours seem so peculiarly localized, almost encapsuled, they run a clinical course so closely resembling that of simple tumours in the human subject, and they present such a finished histological picture, that if we encountered them in man we should be forgiven if we diagnosed them as benign growths. There is a possibility, therefore, that in the experimental work we have on occasion succeeded in transplanting simple neoplasms. It is well to bear in mind the experiments of Ehrlich and Apolant, in which the development of sarcoma occurred during the transplantations of a carcinoma, for in that case the sarcoma, as they pointed out, originated from the connective tissue stroma introduced.

Apart from the investigation of tumours propagated through animals which have given results more of academic than of practical value, laboratory researches have been conducted along other lines—(1) methods of diagnosis, (2) essays in chemiotherapy, and (3) surgical pathology. There has been a great cry for the earlier diagnosis of cancer. It is said by some surgeons unwilling to undertake radical operations in the disease that if cases came to them at an earlier stage much less serious measures would be successful. I am afraid there is not much prospect of hope in this direction. Patients will not seek medical advice before they experience symptoms, and symptoms are notoriously late in obtruding themselves in most cases of cancer. It is remarkable, too, how unobservant some patients are of signs and symptoms when they are well defined. But there is a field for research into possible laboratory methods of diagnosis where the clinical judgement cannot certainly be made. The very fact that in malignant disease no condition of immunity in the wide sense is ever established would induce one to hope that evidence of antibody formation might be found in the blood serum because the so-called antibodies found in the serum in infectious diseases are probably to be regarded as expressions of injury rather than signs of defence. During the last ten years I have put to the clinical test practically all the sero-diagnostic methods that have been proposed. Most of these, if not all, might have been rejected on *a priori* grounds, but it is sometimes the apparently irrational that succeeds in serology. Crile claimed to be able to diagnose cancer with a fair degree of certainty by the fact that the serum of cancer patients haemolysed normal red blood corpuscles, whilst the serum of non-cancerous cases produced no such change. It was then known that isohaemolysis was a fairly common phenomenon, and it is now general knowledge that all human bloods can be grouped accordingly. He must have worked with rather unusual corpuscles in his tests. At any rate we found in repeating his work that the method was utterly devoid of any diagnostic value. For the complement deviation action of v. Dungern great diagnostic worth was claimed, and the claims were substantiated by some of his pupils. He employed an extract of carcinoma and subsequently an extract of red corpuscles as antigen, and the reaction followed the lines of the Wassermann technique. Personally, I was unable to obtain any verification of the claims, and Coca, who worked in v. Dungern's laboratory, was unable to obtain successful results or even to have them demonstrated to him in that laboratory. The cancrolytic reaction of Freund and Kaminer, which I have already mentioned, has not been of any use to us: I have never succeeded in obtaining any emulsion of cancer cells, prepared according to their directions, which normal or other serums would "lyse." The meiostagmin reaction of Ascoli cost me a considerable amount of trouble. It was based on the observation that the union of toxin and antitoxin is accompanied by a diminution in the surface tension of the mixture. Ascoli took dilutions of cancer and non-cancer serums and added to them titrated quantities of extract of cancer or pancreas, or even certain unsaturated fatty acids. The surface tension was determined forthwith by means of Traube's stalagmometer and again after incubation. An increase in the number of drops indicated a diminution of the surface tension. It was agreed by Ascoli that many of the antigens, though prepared in exactly the same way, were quite ineffective. The titration of the antigens was very troublesome, and the only way to obtain an effective antigen was by testing various dilutions of many extracts with actual known serums. Further, a useful extract having at length been obtained by these means it could not be depended on to maintain its property over an extended series of tests. It was said to be exceedingly unstable. I suspect that the good results claimed were obtained by a summation of the favourable trial results and a neglect of the adverse readings. From my own experience with the reaction I was convinced that the results were purely fortuitous, and that the instability of the antigens was another expression for want of luck. The famous Abderhalden reaction was founded on a very attractive hypothesis; numerous papers from all parts of the world supported its great value in the diagnosis of cancer; my own results with this reaction, together with a destructive criticism of the theory, were published in the British Medical Journal (July 25th and August 15th, 1914). I need say nothing further here than that the Abderhalden reaction is devoid of any practical diagnostic value. Disappointing as these and many other serum reactions

including several attempts of my own, have proved, one has still the hope that some useful laboratory reaction will yet be found.

The whole world, medical and lay, looks for the elaboration of some drug that will cure cancer, and many essays in the chemiotherapy of the disease have been made. The experiments of Wassermann and his collaborators with an eosin-selenium compound raised considerable expectations. The details of his experiments were far from convincing to anyone familiar with the behaviour of transplantable tumours, and he was apparently never able either to repeat his successes or even to elaborate the same chemical substance again. Neuberg and others reported successful attempts in the therapy of mouse tumours, but I have always regarded these results as due more to the physical properties than to the chemical constitution of the compounds. They were all protein precipitants, and they probably acted, not directly on the malignant cells, but on the blood within the tortuous and poorly developed capillaries of the tumour. It is difficult to conceive any chemical substance so selective in its action that it will destroy tumour cells and yet leave uninjured the normal cells from which they have sprung, seeing that chemical analyses fail to show any material or constant differences in constitution or metabolism between the one and the other. *X* rays and radium are supposed by some to have this selective property. While one cannot deny that these agents may occasionally produce a local temporary amelioration, reliable evidence is still awanting that they ever bring about cure even in such low malignant lesions as rodent ulcer.

Surgery is, and is likely long to remain, the only means at our disposal of eradicating the disease, but surgical procedures must be based on sound pathology. There is here a fruitful field for the co-operation of the surgeon and the pathologist. The routes by which the disease spreads have only been worked out with any degree of thoroughness in cancer of the breast, uterus, and rectum, and even there the observations are not complete. Much remains still to be done for other organs, but it is interesting to know that in the situations mentioned the radical operative treatment in the hands of those surgeons who are conversant with the facts of surgical pathology gives a cure rate of about 40 per cent., taking as our standard of cure a five years' immunity from recurrence. Fifteen years ago such a success could not have been hoped for. The pathological observations are slow in accumulating, and surgeons are perhaps slow in adopting them, but the results that have attended the operative measures built on pathological findings give encouragement for the future.

Professor Simon Flexner, M.D.,
Director of Laboratories, Rockefeller Institute for Medical Research, New York.

Dr. Simon Flexner, called upon by the President, said that although he had not himself been engaged on cancer research he would like to say a few words on Dr. Murphy's work at the Rockefeller Institute, work which he had followed with the deepest interest. He had unfortunately not been present during the earlier part of the discussion, but he gathered that it had been along the lines of the relationship of lymphocytosis to cancer immunity. Dr. Murphy's work showed that a definite relationship between the two could be worked out. The lymphocytosis could be induced in various ways. After small doses of *x* rays there was at first a diminution of lymphocytes, then followed a period of compensation which lasted two or three weeks. During this period the animals were refractory to cancer inoculation. As regarded the spontaneous disappearance of cancer in man he thought there were two factors which had to be taken into consideration, namely, a local and a general one. For example, a local tumour might disappear but metastases might continue to grow in other situations. It was premature to think of carcinoma in terms of immunology. But the body might perhaps be thought of as being in a different state of immunity in different regions. The immunity in that case would be in the nature of a tissue rather than of a serological reaction. If this were true, there might be local immunity which would cause one tumour to regress while others in a different situation continued to grow.

Professor J. G. Adami, M.D., F.R.S.,
Liverpool.

Professor J. G. Adami said that he could not agree with the theory strongly held by Ribbert that cancer was due to a lessening of the forces acting upon the cell from without and restraining or inhibiting the growth of the potential cancer cell. Experiments *in vitro* showed that there did exist stimuli which Ross had termed auxetic. Warmth, for example, in stimulating increased cell growth, could not act as Ribbert suggested, but told upon the cell directly, increased its metabolic and other activities, so bringing about a greater interchange with resultant increase in substance. To explain cancerous growth he had predicated a similar direct stimulation which, continuing to act for some little time, set up in the cells the habit of growth.

Opener's Reply.

Dr. Murray, in his reply, first took up certain points that Dr. Mottram had raised. Dr. Mottram asked whether the subcutaneous tissues were the best site for tumour grafts. He thought more suitable sites might be found. He had seen cases in which when subcutaneous inoculation failed inoculation into the circulation had been successful. He asked whether there was any difference between the cells of lymphogenous tumours and lymphocytes? Dr. Murray in reply stated that the tumour cells were distinctly larger than lymphocytes but of the same type, as evidenced by the nuclear characters. As to inoculation the difficulty was that inoculation must not be practised in a site where metastases would naturally arise or the experiment would be inconclusive. In reply to Dr. Leitch, he said that sarcomatous elements in a transplanted tumour were derived from the host. He agreed that serological diagnosis of cancer is impracticable at present. In reply to Dr. Russ, he had repeated Murphy's experiments on heating, but, so far, had failed to obtain as much resistance as Murphy did. He considered that there was a fundamental difference between autologous and homologous grafts. This difference could be explained by the variations in the tissues of different animals.

In conclusion, Dr. Murray thanked the speakers for their interesting contributions. In the main the discussion had been along the line of the relation of lymphocytosis to immunity. He himself thought that in cancer we were faced with an alteration in the parenchyma of the cells. Everyone was entitled to his own opinion, but for himself he felt that until our knowledge of cell life was more complete we should make no great advance in cancer research.

THE SECONDARY FORMS OF POLYCYTHAEMIA RUBRA—AYERZA'S DISEASE, Etc.*

BY

F. PARKES WEBER, M.A., M.D., F.R.C.P.

Cases of secondary lymphocytosis, leucocytosis, or myelocytosis, representing a lymphocytic, leucocytic, or myelocytic reaction of the haemopoietic tissues of the body, have been or may be occasionally mistaken for true leukaemia. So also may a secondary erythrocytosis (polycythaemia rubra), representing an erythroblastic reaction of the bone marrow, be mistaken for true erythraemia—that is to say, for polycythaemia rubra, with splenomegaly, dependent on an apparently primary myelopathic condition (primary hyperplasia of the erythroblastic elements of the bone marrow). It is open for any one to maintain that, as very many cases of polycythaemia rubra are obviously secondary to known causes, therefore the probability is that all cases of polycythaemia rubra are secondary to some cause, although the cause may be as yet undiscoverable—that, in fact, all cases of polycythaemia rubra are examples of erythrocytosis and are results of an erythroblastic reaction towards the exciting action of some (known or unknown) "agent." If this surmise be ultimately found to be correct, there will be no primary myelopathic disease left which can be termed erythraemia—and,

* A paper read at the Medical Section of the Royal Society of Medicine on October 26th, 1920.

indeed, the surmise may perhaps be correct. Perhaps it will be also proved that there is no primary myelopathic disease which can be termed leukaemia, and that all so-called leukaemias are really only manifestations of lymphoblastic, leucoblastic, or myeloblastic reactions towards the exciting actions of (as yet unknown) "agents." At present I wish to classify certain conditions accompanied by erythrocytosis (erythroblastic reaction) which may be mistaken for erythraemia—that is, for polycythaemia rubra of unknown cause, apparently due to primary hyperplasia of the erythroblastic tissues.

1. *So-called Polycythaemia Hypertonica, or Hypertonia Polycythaemica* (Geisböck, etc.).—In these cases there is no obvious splenomegaly and the brachial systolic blood pressure is high (usually 180 mm. Hg, or higher), whereas in true cases of erythraemia the blood pressure is not high (usually 120–150 mm. Hg), unless chronic interstitial nephritis is present as a complication. These cases are, in my experience, not very rare amongst the middle-aged male Hebrews of the east end of London. They may be mistaken for neurasthenia at first, and there is perhaps a neuropathic element in the etiology; but whatever the etiology may be, I believe that the polycythaemia rubra is in some way secondary to the high blood pressure, whether the latter is connected with granular kidney (as it not rarely is in these cases) or is an arterial "hyperpiesia" (without organic renal disease) of Sir Clifford Allbutt. Why it is not present in most cases I do not know, unless it represents a peculiar type of vital reaction.

2. *Splenomegalic Polycythaemia Rubra connected with Tuberculosis of the Spleen.*—That this association does really occur has been verified by *post-mortem* examinations, although it is possible that in some cases of erythraemia necrotic foci due to thrombotic infarction, or of syphilitic gummatous nature, have been mistaken for caseous tuberculous lesions. Owing to experimental and clinical observations, there can be no doubt that tuberculous infections do sometimes give rise to a condition of more or less polycythaemia rubra (an erythrocytosis due to secondary erythroblastic reaction) of longer or shorter duration. Tuberculosis in the spleen usually causes enlargement of the organ, and this, together with the just-mentioned tuberculous erythrocytosis, can quite well occasionally give rise to the clinical and pathological syndrome of splenomegalic polycythaemia. Moreover, one of the normal functions of the spleen is apparently to prevent excess of erythrocytes in the blood; and, whether this function does or does not depend mainly on the haemolytic action of the organ, it is certain that the operation of splenectomy (performed on account of injury or disease) is usually followed by increase of the erythrocyte count.* Tuberculosis, or other disease of the splenic pulp, may occasionally in some way upset this normal function of the organ, and thus (somewhat as splenectomy does) produce a rise in the erythrocyte count, quite apart from that due to the activating effect of small quantities of tuberculin in the circulating blood on the erythroblastic elements of the bone marrow.

3. *Secondary Polycythaemia Rubra (of Longer or Shorter Duration), with Splenomegaly, connected with a Condition of Visceral Blood Stasis of Chronic Thrombotic Origin in the Splenic and Portal Veins.*—Some cases of this kind have been clinically mistaken for erythraemia, and even after their true nature has ultimately been cleared up by *post-mortem* examination the term "erythraemia" has still been applied in a symptomatic sense.

Cases of this kind associated with polycythaemia rubra are exemplified by those of Van der Weyde and Van Ijzerem,[1] Lommel (his first case),[2] and Chauffard and Troisier.[3] The splenomegaly of chronic non-suppurative pylephlebitis, or, rather, of obstruction due to chronic thrombo-phlebitis in the portal vein or its tributaries,† is, however, not generally associated with a high erythrocyte count—at all events, not so high as the count often is in typical cases of erythraemia. Moreover, the polycythaemia rubra, when it does occur in these cases, is often present only for a period (cf. the case of Monro and Teacher[4]): it will probably be found to give place to a normal erythrocyte count later on, or to an anaemic condition of actual oligocythaemia rubra. In the latter event the clinical diagnosis is not unlikely to be "splenic anaemia" or "Banti's disease." Patients with thrombotic obstructive splenomegaly of this kind may live a relatively long while. There are usually more or less long intervals during which they seem fairly well excepting for the splenomegaly. One such case—a woman aged 23 years—I showed before the Clinical Section of the Royal Society of Medicine in 1912.[5] A blood count in July, 1911, had given 4,660,000 erythrocytes and 3,500 white cells, and perhaps the case might have been then taken for (if the term be permitted) "anaemia splenica sine anaemiâ"; there was, indeed, always leucopenia present. But relapses are likely sooner or later to occur with fresh thrombotic trouble in the portal circulation, and attacks of haematemesis may supervene. There were such attacks preceding the fatal termination in my case.[6] In these (thrombotic portal obstructive) cases of splenomegaly it seems to be a question of "individual vital reaction" (individual peculiarity in erythroblastic reaction) whether the erythrocyte count is high (polycythaemia rubra), or normal, or low (oligocythaemia rubra). As in most kinds of chronic non-leukaemic splenomegaly, the count of white blood cells tends to be low (leucopenia). But, whatever the blood count may be, the operation of splenectomy is contraindicated, or certainly not advisable, though it has been performed in certain cases, in which the correct diagnosis was not made until after the operation and the *post-mortem* examination.‡

4. *Chronic "Cardio-pulmonary" Cyanosis, with Secondary Polycythaemia Rubra ("Cardiacos Negros" of Ayerza—"Ayerza's Disease" or "Ayerza's Syndrome").*—Anyone who has seen much of Hebrew patients from the east end of London must have observed a clinical group—mostly males between 30 and 50 years of age—suffering from chronic cyanosis (varying in degree from time to time), with marked dilatation of the blood capillaries and venules (telangiectases) of the face. The condition is, however, certainly not confined to Hebrews, though I think that it is commoner among them than among others. There are diffuse chronic bronchitic sounds present, with evidence of pulmonary emphysema, dilatation of the right side of the heart, and passive congestion of the liver, which reaches down below the ribs. All these signs vary in degree from time to time, and the active bronchitis may temporarily disappear. The spleen, though it may be enlarged in some cases, can seldom be felt below the costal margin by ordinary palpation. The fingers are sometimes clubbed. The brachial systolic blood pressure is not raised (is relatively low rather than high) in cases not associated with chronic interstitial nephritis. Mostly the patient gives a history of having suffered for many years from "asthma" or from recurrent attacks of bronchitis. At last dyspnoea occurs on any slight muscular exertion or becomes continuous, and exacerbations of bronchitis are frequent; the cyanosis becomes deeper, of a dark purple colour; subcutaneous oedema, and often also more or less ascites, develop; signs of carbonic acid poisoning ("bronchite noire") and failure of the right side of the heart precede death. Hypertrophy and dilatation of the right side of the heart are found on *post-mortem* examination; the wall of the right ventricle is sometimes as thick (or nearly so) as that of the left ventricle.

The secondary polycythaemia rubra in these cases may be very considerable, and rival that of erythraemia ("Vaquez's disease") and cases of "congenital cyanosis" (due to congenital malformations of the heart). In at least two of my cases the erythrocyte count reached between 9 and 10 millions per cubic millimetre of blood. The bone marrow in one of my cases was examined after death, and a decided erythroblastic reaction was found present. The total blood volume in these cases has not, as far as I know, been estimated, but by analogy with cyanotic cases of congenital heart disease in adults, I have no doubt that it is above the normal, though, of course, to a much less extent than the total haemoglobin in the body.[7]

In 1913 I collected several cases of chronic cardio-pulmonary cyanosis with secondary polycythaemia rubra in a paper read before the Medical Section of the Royal Society of Medicine,[8] which was also published in French.[9] In this paper I wrote that, in regard to etiology, former abuse of beer or alcoholic drinks sometimes plays a part, in addition to asthma, pulmonary emphysema, chronic (and I might have added recurrent) bronchitis, old bilateral pleuritic adhesions, chronic interstitial pneumonia and pulmonary fibrosis (which last may be partly of chronic tuberculous origin). I had read a French abstract of a paper by Dr. F. C. Arrillaga (Buenos Aires) in 1912, and added: "Arrillaga attributes the onset of the cyanotic stage

* Conversely, A. W. Downs and N. B. Eddy have in rabbits experimentally produced a temporary decrease of the erythrocyte count by subcutaneous injections of a protein-free splenic extract.

† The splenic artery may be likewise affected, so that the condition becomes one of a visceral thrombo-angiitis, there being a certain amount of thrombo-arteritis as well as thrombo-phlebitis.

‡ On the whole question of chronic thrombotic obstruction in the portal and splenic veins and their occasional cavernous-like (haemangioma-like) transformation owing to compensatory canalization, etc., cf. the cases and writings of W. Oettinger and N. Fiessinger (1907), F. Dévé (1908), G. Dock and A. S. Warthin (1904), H. Curtis and T. W. P. Lawrence (1909), Sir J. Bland-Sutton (1902), W. Risel (1909), E. Bode (1909), L. Pick (1910), M. Versé (1910), M. Simmonds (1912), C. Hart (1913), C. A. Ewald (1913), Sir C. Gordon Watson (1913), Pio Foa, E. Stadelmann (1913), and F. Geppert and K. Siegfried (1914).

to the occurrence of secondary sclerosis in the pulmonary artery, but I think that this explanation can only occasionally be the correct one, possibly only in exceptional cases." (Owing, however, to obstruction in the circulation of blood through the lungs in these cases, there is increased blood pressure in the pulmonary artery, as confirmed by the presence of dilatation and hypertrophy of the right side of the heart, and therefore degenerative changes in the pulmonary artery, it must be admitted, are very likely to occur.) I also mentioned that, so far as I could judge, the best marked polycythaemic reactions occurred in individuals (especially asthmatics *) of Jewish race, and at about middle age, when the reactive power in the haemopoietic bone marrow is probably stronger than in old age. A feature of some diagnostic importance in these cases is that the cyanosis and erythrocytosis may exist for a long period before the patient's death.

Dr. Arrillaga, who read the French translation of my paper (1913), kindly wrote to me (in April, 1913) and sent me a copy of his elaborate medical thesis (National University of Buenos Aires, 1912) entitled "Esclerosis secundaria de la arteria pulmonar y su cuadro clinico (*cardiacos negros*)." He wrote to me that my cases were examples (several of them certainly were) of so-called "black cardiac cases"—"cardiacos negros"—the clinical and pathological condition of which has been described in a clinical lecture, delivered in 1901, by Professor Abel Ayerza (whose pupil he was), of the National University of Buenos Aires; he especially drew my attention to the changes which had been found in the pulmonary artery.

The term "Ayerza's disease" for this group, "cardiacos negros," seems to have been first used in a medical thesis by Dr. C. A. Marty on "La tension arterial en la tuberculosis pulmonar" (Buenos Aires, 1909, p. 45), in which (according to A. S. Warthin—see further on) the author says that there is a special group of cases worthy of attention because of increased pulmonary artery tension associated with hypertrophy of the right heart, pulmonary arterio-sclerosis, and chronic cyanosis, described eight years previously by Ayerza as "cardiacos negros." According to Warthin (see further on), the term "Ayerza's disease" has also been used by Escudero and Garcia del Real, and in 1917 Barlaro (*Rev. Assoc. Argent.*, 1917, vol. xxvi, p. 121) reported a case of "Ayerza's disease" characterized by extreme cyanosis, asthma, intense dyspnoea, cardiac hypertrophy, polycythaemia rubra (an erythrocyte count of 6,600,000), enlargement of the liver, but no palpable enlargement of the spleen, a positive Wassermann reaction, and pulmonary arterio-sclerosis. A. S. Warthin's case was described at the thirty-fourth annual meeting of the Association of American Physicians in June, 1919,[10] as "a case of Ayerza's disease—chronic cyanosis, dyspnoea, and erythraemia, associated with syphilitic arterio-sclerosis of the pulmonary arteries." The patient was a labourer, aged probably about 43 years. At the end he became very somnolent (I suppose from chronic carbonic acid poisoning). The necropsy showed (amongst the other findings) typical mesarteritis of the pulmonary artery and aorta (microscopical examination), fibrosis and emphysema of the lungs, and extreme dilatation of the right heart. I should regard the so-called erythraemia in Warthin's case as an example of chronic cyanosis, with secondary polycythaemia rubra of "cardio-pulmonary" origin, on an old syphilitic basis. I do not believe that syphilis is an essential factor in "cardiacos negros," and do not think it was present in most of my own cases. I think, moreover, that the word "erythrocytosis" (that is, secondary polycythaemia rubra) should be used instead of "erythraemia," because the polycythaemia rubra is obviously secondary and of "cardio-pulmonary" origin.

The cases are probably not likely to be often confused with typical erythraemia ("Vaquez's disease"). Nevertheless W. S. Lucas, in his elaborate and excellent paper of 1912,[11] has, I think, described two typical cases (the two original reports in his paper) of secondary polycythaemia rubra of cardio-pulmonary origin (without splenomegaly), that is to say, *cardiacos negros* of Ayerza, as examples of erythraemia. It is not therefore surprising that Warthin, who refers to Lucas's extensive survey of the subject of erythraemia, regarded cases of "cardiacos negros" or "Ayerza's syndrome" as examples of cases that had been included under the heading "erythraemia."

Clinically, the obvious signs of disorder of the respiratory system (and the clubbed fingers when present), the usual absence of evidence of splenic enlargement to ordinary palpation, and the very frequent presence of an enlarged liver (chronic passive congestion), should greatly help to differentiate Ayerza's syndrome from cases of true erythraemia.

5. *Secondary Polycythaemia Rubra connected with Congenital or Acquired Heart Disease.*—These cases are so well known and of such common occurrence that I need scarcely mention them. The cyanotic condition of the blood, due chiefly to stasis, is the main factor in exciting the erythrocytosis. The spleen is seldom palpable to ordinary clinical examination.

I have now shortly discussed the main groups of secondary polycythaemia rubra which should always be kept in mind in regard to the diagnosis of erythraemia. There are certainly other varieties of erythrocytosis (accompanied or not by enlargement of the spleen), which might be considered in a longer survey of the subject. Another paper could be devoted to the consideration of: (1) The temporary moderate polycythaemia rubra occasionally connected with tuberculosis, especially tuberculosis of lymphatic glands in young adults, with or without slight splenomegaly; (2) a form of "plethoric obesity" with endocrine disturbance, especially in women with positive Wassermann reaction, about the menopause period; (3) temporary polycythaemia rubra in children with inherited syphilis and with more or less splenomegaly, and in some rachitic children with or without splenomegaly.

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THE ACTION OF CHEMIOTHERAPY.*

BY

J. E. R. McDONAGH, F.R.C.S.

Resistance.

To understand the action of chemiotherapy in the body it is necessary to bear in mind that the parasite is attacked indirectly through the host's resisting substance, and not directly by the drug prescribed. The resisting substance is the protein in the serum and the protein which forms the protoplasm of such cells as lymphocytes and their offspring, the plasma cells. The action of the former is general, and of the latter local. The protein exists in the form of particles, which can be best visualized by calling to mind the picture produced when the sun enters a darkened room through a crevice in the blind and shows up the dust as minute motile particles. In the case of the serum the particles move about in a liquid medium, and not only is there a constant interchange between the solution itself and the particles suspended therein, but there is also a rigid balance maintained between the two, known as the normal hydrogen-ion concentration. Any disturbance of the normal hydrogen-ion concentration prevents the particles from fulfilling their functions. If we compare each particle with a man we shall be able to picture its action. A man is a complex machine moving and living, provided he has sufficient oxygen around him. There must be a balance between him and the air, if he is to do his work—the normal hydrogen-ion concentration of the protein particle. When our man is attacked by another man—the parasite—he will endeavour to overcome him by adjusting things around him and by calling others to his assistance, if the intruder has not been vanquished in the first onslaught. The same with the protein particle: it is ever ready to resist invasion unless its oxygen supply has been lessened by such substances as alcohol, etc.—hence the reason why a patient under the influence of alcohol is more likely than one sober to contract a venereal disease. Should the parasite win its first encounter and become implanted in the host, it has to guard its own oxygen supply very jealously, as it and its comrades are far outnumbered by the protein particles, which by this time have called others to their assistance. The fight between the parasites and the protein particles can be compared with trench warfare, as the fight is a surface one with an interspace between,

* There is a neurotic element probably present in some cases, which may be increased by mental worry, or also, it is just possible, by the habit of "coitus interruptus," to which habit one of my patients, a strongly built man (a joiner by trade), aged 39 years, was inclined to attribute the causation of the "shortness of breath" from which he commenced to suffer at about the age of 29 years.

* A paper read before the Suffolk Branch of the British Medical Association, June 17th, 1920.

like no-man's-land, and the fight is one of electrical neutralization, which corresponds to the arms of human combatants. The parasite exhibits on its surface not the oxygen necessary for its existence, but the means whereby this supply of oxygen is maintained. The host's protein particles, on the other hand, exhibit their oxygen on the surface, as there is not the same need to conserve it. As the oxygen on the surface of the protein particles electrically neutralizes the hydrogen which maintains the supply of the parasites' oxygen, then, provided sufficient of this oxygen is to hand, the parasites' means of living will be cut off and they will perish. This is the warfare practised in all parasitic invasions, but is only successful, generally speaking, from the host's point of view, in staphylococcic and streptococcic infections. As parasites became more advanced, they protected themselves by forming impregnable capsules and spores, while others have entered the cells of the host they were attacking, which have rendered them wellnigh invulnerable. The cancer parasite, which I take to be the host's cell itself, so physically altered as to become parasitic on its surrounding fellow creatures, has so far resisted all attempts to overcome it. The protein particles have advanced also in their methods of attack by increasing in number and size, and by building up their structure to approach as near as possible to that possessed by the parasite. These manœuvres not only enable more of the drug prescribed to be taken up by the particles, but they intensify the surface action between the parasites and themselves, just as two pieces of wood will fit better when dovetailed than when merely placed side by side. Should none of these efforts suffice to vanquish the parasites, and should the particles have spent themselves in forming their surface oxygen by the usual methods, they are obliged to resort to indirect methods to produce this oxygen, and this they do by calling into play their reducing action. It is the reducing action which prevails on the surface of the parasites and which conserves their oxygen beneath; therefore when the host's protein particles call upon their reducing action —the circumstance which marks the chronic stage of an infection—they themselves approach to the conditions under which the parasites are living. If the fight be mainly local, what has taken place in the protein particles of the serum takes place in the attacking cells. Should such cells still be unable to overcome the enemy, they are liable to undergo changes (nuclear division and nucleolar activity) in which the nucleoli, by division and budding, attempt to achieve what the cells themselves have failed to do. These changes destroy the relationship between such cells and those surrounding them as to make the former parasitic, and this is the way in which I think that chronic inflammation may lead to malignant disease. Therefore, in attempting to overcome an infection, the attacking cells may themselves become parasitic.

Oxidation and Reduction.

We must now discuss the maintenance and increase of the oxygen on the surface of the protein particles. The surface active oxygen, which appears most likely to be a modified hydroxyl group, with a negative electric charge, is maintained in the human body by the action of iron. In certain invertebrates copper fulfills this purpose, and in plants manganese. The metal acts as a catalyst—that is, it can produce an enormous amount of active oxygen without itself being used up in the process, but it requires a medium to work upon before its work is done, and success is not achieved in every case, partly because this medium is destroyed in the process. Most metals act as oxidizing agents, though with varying degrees of activity, but as most of them are particularly apt to destroy the medium just mentioned, toxic manifestations are liable to follow their use. The medium is formed in the reducing action—an action regulated in all plant and animal life by sulphur, a non-metal, and enhanced by iodine. Just as a metal forms oxygen in the form of hydroxyl, sulphur forms hydrogen which possesses a positive electric charge. The action of this hydrogen is to convert the metallic compound formed in the oxidase reaction back into the form in which it acts as a catalyst. Hence destruction of the hydrogen on the surface of the parasites by the hydroxyl group on the surface of the protein particles by electrical neutralization robs the parasites of their means of keeping up the active oxygen necessary for their existence. It will now be clear from these few sentences why metals are indicated before non-metals in the acute stage of an infection, and non metals before metals in the chronic stage, why in *both* stages both metals and non-metals have their right place, and why a metal is an antidote for non-metallic poisoning, and a non-metal for metallic poisoning.

Chemiotherapy.

We now come to discuss the choice of the element and the form in which it should best exist. Iron was one of the commonest metals which was found on the earth's crust when the ball of elements in the gaseous state had condensed on the surface so far as to render life possible. As iron has two hydroxides which are readily reversed by hydrogen, it is not to be wondered at that cellular activity was largely bound up with the metal iron, and that iron is the metal to-day which regulates the oxidizing action of our protein particles. The only other metal exactly akin to iron is manganese, hence my reason for having introduced this metal for the treatment of acute coccal infections. The action of a metal depends upon the amount which the protein particles can take up. The particles can take up little or none if the metal is incorporated in the form of a simple salt, it can take up much if in the simple colloidal form, and more still if the molecule be so increased in size and form as to approach that of the protein particle itself, just as the surface action between the protein particles and the parasites is increased as the former build up their molecules to simulate those of the latter. This is called an homologous stereo-chemical molecular configuration, and it is the cause of specificity. As the number of protein particles produced bears a ratio to the kind and severity of the infection—being few if the parasite is lowly developed and numerous if it is highly developed—it can readily be understood that the state in which the metal is needs to be more complex in protozoal infections than in bacterial infections. As the response on the part of the host is less the more lowly the organism, and as metals, if used in too large doses and too frequently, destroy the patient's protective substance, it becomes clear why simpler products should be used in bacterial than in protozoal infections, and why in all cases, especially in the former, so much attention should be given to the dose and frequency with which the injection is prescribed. In acute staphylococcic and streptococcic infections colloidal manganese, now supplied in the form of trimine, has produced results which far exceeded my expectations; but not more than three injections should be given at a time, and it is rarely necessary to exceed a dose of 2.0 c.cm. Trimine contains iron and zinc in addition to manganese; my reason for making this change was because I found that three injections of three different oxidizing agents gave better results than three injections of any one. When we come to gonorrhoea, we find that trimine is useful, especially in the acute stage of complications, such as periurethral abscess, cowperitis, prostatic abscess, and epididymitis, but not generally so efficacious as in the simple coccal infections. This is due, in my opinion, to the fact that the gonococci quickly take on an intracellular habitat, and live at the expense of the polymorphonuclear leucocytes, not vice versa as is usually thought to be the case. I take phagocytosis to be a laboratory phenomenon, and not one which occurs *in vivo*. The function of the polymorphonuclear leucocytes is to remove from the battlefield the bodies of organisms which have been killed in the way already described.

As gonorrhoea is a disease which is so likely to be contracted if the patient is under the influence of alcohol, owing to the effect alcohol has in depressing the oxidizing action of the protein particles, I introduced colloidal palladium for use in the acute stage of a first infection, with excellent results in those cases which are caught early enough. Palladium was chosen in view of its extraordinary power in temporarily occluding several thousand times its own volume of hydrogen—an action which might naturally be expected to increase for a time the oxidizing effect of the protein particles. The gonococcus is the organism *par excellence* for giving rise to the formation of fibrous tissue. Fibrous tissue formation is a sign that the infection has reached the chronic stage, and often—to use a loose term—that the blood is too acid. As this synchronizes with an increased reducing action

of the protein particles, and as in the chronic stage of an infection relatively more of the drug prescribed has to be taken up before the effect desired is produced, it became necessary to have a preparation of a non-metal with as large a molecule as possible, so as to enable the protein particles to take up the maximum quantity of the element. For this purpose I introduced intramine, which is an amino-compound of sulphur. Intramine has given results in gonorrhoeal rheumatism and in the chronic stage of gonococcal complications which can be achieved by no other preparation in use at present, and it is many times more powerful than plain colloidal sulphur, just as arseno-benzene is infinitely superior to plain colloidal arsenic. Iodine acts by increasing the sulphur metabolism, owing to the effect it has in converting a substance (mercaptan) formed in the reducing action back into catalytic sulphur. In other words, iodine doubles the action of sulphur, and acts in the reductase reaction as does hydrogen in the oxidase reaction. Owing to the disadvantages of the salts of iodine and to the inefficacy of most of the organic preparations, I introduced colloidal iodine, which can be injected intravenously in the same form as it is taken internally without ever producing symptoms of iodism. There being no specific action in my oxidation and reduction theory of chemiotherapy, it will be clear why intramine should be so valuable in the chronic stage of all infections, in the late stages of syphilis, in metallic and other acid intoxications, and applied locally to indolent and chronic sores. In mercurial and arsenical poisoning the combination of colloidal iodine and intramine will cause almost instantaneous amelioration, and it has already saved many lives. The use of intramine in early syphilis rids primary sores of their induration and diminishes the incidence of neuro-recurrences, while in certain forms of late syphilis—glossitis, for instance—intramine will frequently achieve what arseno-benzene has failed to do. The reason why arsenic was chosen for the basis of chemiotherapy was because it is one of the easiest metals to work with; it has no specific action, and I am sure if suitable organic compounds of iron and manganese could be produced, no more arsenic would be employed, and we should be saved the hundreds of cases of arsenical poisoning which are occurring, and the enormous increase of nervous syphilis would be reduced to a minimum. The reason why arseno-benzene appears to be so efficacious in syphilis is merely because there are more protein particles formed in this than in any other disease, consequently large amounts of a drug can be taken up, and the oxidizing action of the protein particles can be increased to the maximum. Mercury acts in syphilis in the way it does, first, because of the increased number and size of the protein particles in this disease, and secondly, because in virtue of its high atomic weight it has the properties approaching those of a colloid, and is therefore readily taken up by the protein particles. Any metal having as high an atomic weight or higher will produce the effect on a syphilitic lesion which mercury does; thorium will, for instance. This is probably the reason why the emanations of radium, which have a high atomic weight, are useful in malignant disease. In treatment with metals and non-metals, destroying the patient's resistance, which is so easily done by using too large doses and prescribing too many injections, will give the parasites the upper hand, hence the reason why we are seeing so many cases of syphilis to-day which seem to get worse the more arseno-benzene and mercury is given, and cases which relapse even while under treatment. Unfortunately the disappearance of symptoms does not mean cure of the disease, and all we can really say we do by treatment is to render organisms dormant by increasing the resistance of the host which is harbouring them. Consequently we should in treatment think of the patient and not of the disease, so as to avoid destroying his resistance, which is so easily done by over-treatment. Ideal chemiotherapy, then, is to render organisms dormant and keep the host's resistance in a state which will maintain them so.

IT is estimated that from October, 1918, to March, 1919, 2 per cent. of the American aborigines died of influenza. In some districts the mortality amounted to 41.2 per 1,000.

A COMMITTEE has been formed to erect a marble monument at Tournai in honour of the eighteenth century ophthalmologist, Michel Brisseau, well known for his work on cataract.

THE EFFECTS OF THE EMOTIONS ON GASTRIC SECRETION AND MOTILITY IN THE HUMAN BEING.

BY

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DURING the past year the fractional method of gastric analysis, first introduced by Rehfuss in the United States, has been employed by one of us (T. I. B.) in conjunction with Dr. J. A. Ryle, in an extensive investigation into the secretion and motility of the gastro-intestinal tract in health and disease. The wide possibilities which the method offers for physiological research were soon apparent, and the present communication is a preliminary report concerning one branch of the inquiry.

That the emotions can moderate digestion to a notable degree has long been recognized; the work of Cannon on frightened animals, and Pavlov's observations on appetite juice are the best known examples. But the present is, we believe, the first occasion on which these effects have been demonstrated on the human subject, and we hope that this communication may lead others to continue an inquiry which, owing to the method employed, allows accurate data to be collected concerning emotions which cannot be evoked in mere animal experiments.

The Method.

The subjects of our experiments were all healthy medical students from the Physiological Department of Guy's Hospital. All experiments were carried out in the morning, beginning at 9.30 o'clock, the subject having taken nothing by the mouth since the previous evening.

In each subject the normal curve was first ascertained; a gruel meal was given, made by boiling two tablespoons of oatmeal in a quart of water until the bulk was reduced to one pint and then filtering through muslin. Samples of the gastric contents were then withdrawn every quarter of an hour through the Rehfuss tube, and the percentage of free and total acid estimated and plotted in a curve. Careful histories were taken from all cases in order to ascertain the most suitable emotive disturbance to be evoked. Each subject was several times interviewed and a light degree of hypnosis produced before the final experiment. The subject's normal curve and emptying rate being established (the latter by finding, by means of iodine, the point at which starch disappeared from the samples of gastric contents), he was told to come up, again without food or drink, on a subsequent morning. On arrival the Rehfuss tube was swallowed and the gruel meal given, the first few specimens were drawn off at the usual times and the subject was then hypnotized. One of us (J. F. V.) then made suggestions appropriate to evoke the required emotion, whilst the other continued to withdraw gastric samples at the regular intervals. Hypnosis was never continued for more than half an hour, nor was it ever pressed to a deep degree. The subjects were always able to remember everything that had happened and had been suggested to them, but were never informed before the experiment as to what emotion was going to be suggested.

It is not possible at the present time to give any precise definition of the hypnotic state; at the depths to which it was carried in our experiments it is very closely analogous to light sleep; the subject has cut off his sensory receptive system from all external stimuli, save those reaching him, via his ears, from the observer. His voluntary musculature receives no efferent impulses from his brain, which for the time being concerns itself solely with the transmission of those reflex and involuntary impulses which result from the suggestions of the observer.

After the hypnosis, on waking up, the subject passed the remainder of the morning in a manner as similar as possible to that of the previous control mornings—that is, he read a newspaper or a textbook, talked with his companions on indifferent topics, or helped with the gastric analyses. Specimens of his gastric contents were still withdrawn every quarter of an hour, until the stomach was empty. In this manner two curves were obtained, the first being the normal curve for the individual, the second a curve showing the effects of the suggested emotion. The emptying rate was also carefully recorded in each case.

Results.

1. *Nausea.*—The subject selected for this experiment was a healthy man of athletic type; for experimental

purposes he had the advantage of possessing a motile stomach which normally empties itself of its gruel meal in three-quarters of an hour. His normal curve being established, he was, after the meal, told that he was feeling exceedingly sick, with no tendency to vomit, but a perpetual intense nausea. On waking from the hypnosis he was able to give a clear account of his sensations and still felt rather sick; but this soon passed off and on the conclusion of the test meal he was able to eat a hearty meal as usual.

Fig. 1 shows the result of this experiment; it will be seen that the usual sharp rise in acidity is completely inhibited, only at the conclusion of hypnosis does it rise appreciably, but it then rises more rapidly than normally, and the last few drops of gastric contents were markedly acid. The alteration in emptying rate is equally marked; in the specimen withdrawn at the end of hypnosis there was a large proportion of gruel, though this subject's stomach is normally empty by this time. The effect is, probably, an example of pure sympathetic inhibition, the pyloric sphincter being tightly closed and the secretion of HCl checked by the emotion; the subsequent rise in acidity will be understood by reference to the law given in the next section.

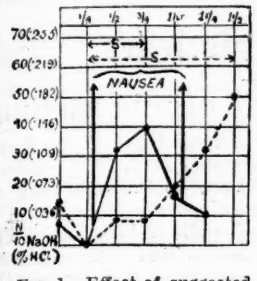

FIG. 1.—Effect of suggested nausea on gastric acidity and motility. Free HCl only plotted. Continuous line = normal curve. Broken line = experimental curve. Rate of emptying shown thus ←— S —→.

2. *Hunger.*—Our procedure was similar to that in the previous section, except that intense hunger was suggested. In preliminary experiments we had exhibited attractive food, had cooked eggs, etc., in the presence of subjects undergoing fractional tests, without ever having produced any definite alteration in their acidity curves. Salivation was indeed freely provoked, but even when the mouth was filled with absorbents so as to check the swallowing of saliva, no psychic flow from the stomach could be proved.

The first experiments we made with hunger suggested under hypnosis produced similar negative results, a curve apparently identically the same as the normal curve being produced. We then tried the effect of suggesting the satisfaction of hunger; the subject was told that he was enjoying the sensations experienced after finishing the first hearty meal for a long time. Again our results were negative. We then noticed that although the acid curve had not been appreciably affected by the hunger suggestion, there was in all these cases a notable quickening of the emptying rate.

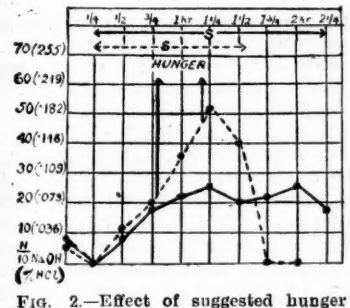

FIG. 2.—Effect of suggested hunger on gastric acidity and motility.

We repeated our experiments, making the hunger suggestion at a rather later point, at a moment when the subject's normal curve is beginning to rise; we now got positive results, the most striking of which is shown in Fig. 2. Now, though the increase in acidity is marked in this case, the increased rapidity of emptying is perhaps still more striking.

It was the consideration of these cases which led us to recognize the following fundamental law:

> "In a stomach which is secreting hydrochloric acid, any increase in the rapidity of emptying will by itself determine an increase in the acidity of the contents."

An examination of Fig. 3 will make this law evident. If the stomach be regarded as a reservoir fitted with a tap (the pylorus), and if the oxyntic cells be regarded as a second reservoir pouring acid into the main one, it is evident that if the main contents are escaping rapidly through the pyloric tap, their acidity will more rapidly increase than if the total bulk of the contents diminished more slowly.

Obvious though this conception be, it has hitherto escaped the attention of all the physiologists and gastrologists to whose work we have had access. This law accounts for our failure to cause an increase in acidity when the hunger suggestion was applied before the acid secretion was at its height. It also accounts for the marked rise of acidity following the removal of the nausea suggestion shown in Fig. 1.

A further interesting question raised by these experiments is that of the mechanism of the normal sensations associated with hunger. Carlson, in his admirable work on *Hunger in Health and Disease*, proves clearly that the sensation of hunger arises normally at the time when the normal peristaltic waves of the empty stomach are changed to a series of much more vigorous contractions. These contractions he regards as the primary factor causing the sensation. Our experiments show the reverse of this; they demonstrate clearly that when the brain is filled with the conception of hunger, vigorous gastric peristalsis is the result. In our opinion there is nothing contradictory in these results; what could be more logical than that so complicated a reflex should be reversible? The timid traveller sees a robber behind every bush.

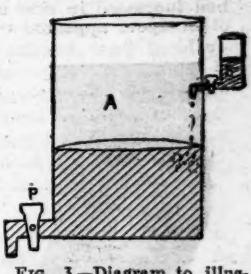

FIG. 3.—Diagram to illustrate the effect of rapid emptying on acidity. A, Stomach; B, Oxyntic cells; P, Pyloric tap.

3. *Anxiety.*—The effect of rage and fear on the gastric functions has long since been observed in animals; our observations can accordingly claim no originality beyond that of their method. We were lucky in this branch to secure the co-operation of two gentlemen who served with distinction in the Royal Flying Corps during the late war. Both were in good health, and had been discharged fit from the service; but both of them had, during their war experience, had sufficient association with extreme danger to know the meaning of the word anxiety. They had, in fact, "crashed" at various times, though happily without receiving serious permanent injury.

A curve from one of them is here shown (Fig. 4); under hypnosis it was suggested to him that he was again flying, that the weather was foggy, and that he was forced to attempt a landing, although in the vicinity of an enemy town. On recovering from the hypnotic state he said that he had "had the wind up" badly; indeed, he and his companion felt the physical effect of the suggestion for some hours afterwards, although very amused at the experiment. A strong sympathetic inhibition is seen in the curve, with a notable delay in the emptying rate, but the preliminary rise in acidity is less easily explained; can it be that the immediate effect of a hyperadrenalism caused by anxiety is a quickening of peristalsis, to be followed by arrest?

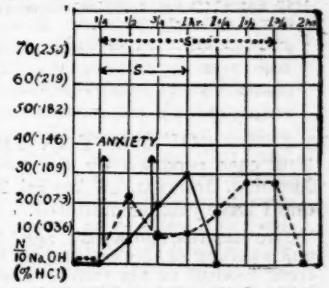

FIG. 4.—Effect of suggested anxiety on gastric acidity and motility.

Such experiments as this last cannot, we feel, be frequently repeated on one subject without risk of establishing a noxious reflex; we have accordingly, with suggestions of this nature, limited our experiments to a single one in the case of any particular subject, taking care at the end of hypnosis to remove the suggestion as fully as possible. This has naturally limited the aggregate number of our results.

Further investigations, dealing with other emotions, are in progress.

In conclusion, we would here like to express our indebtedness to Messrs. Stoker, Currie, Taylor, Greenwood, Mitchell, Moffatt, Powell, Lane, and Wornum, of the physiological department of Guy's Hospital, without whose intelligent and often devoted co-operation this work could not have been attempted.

Memoranda:

MEDICAL, SURGICAL, OBSTETRICAL.

A CASE OF CASTELLANI'S ACLADIOSIS.

On June 8th, 1920, a Chinese coolie, working in a local rice mill, entered the out-patient clinic of the Central Hospital.

Clinical History.—About four months ago he first noticed a small red spot below the left knee; there was a very slight amount of itching but no pain, and within a month this spot had increased in size and developed into an ulcer. Several other spots appeared within the neighbourhood of the first one and passed through the same stages. At no time was there much discomfort, and only a very slight amount of itching. Upon close examination, lesions that very closely resembled yaws were observed on the left leg, as shown in the illustration. They were covered with a thin yellow scab, which revealed upon removal a collection of thick creamy pus. After thorough cleansing the lesions presented, instead of the mulberry appearance of yaws, a sharp depression of a red granulating tissue. The borders of these ulcers were clearly defined, with a rounded surface of normal tissue. There was no gland involvement whatever, and the rest of the body was free from any skin trouble. The blood examination was negative, except for a slight leucocytosis. The urine examination was negative. The physical examination except for the skin trouble was also negative.

Bacteriological Examination.—Various media were inoculated from scrapings of the sores. On carrot and potato a creamy abundant growth developed, which turned darker in the course of a few days. On glucose agar the growth was also abundant. Microscopical examination of the growth showed the presence of fungus growing in symbiosis with a coccus, which could with difficulty be separated from it. The fungus had all the morphological and cultural characters of *Acladium castellanii* (Pinoy, 1916). The detailed botanical account of it with drawings, microphotographs, etc., will be given in a future publication.

Large doses of mixed iodides and daily dressings at the clinic produced rapid and satisfactory results.

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GUNSHOT IN THE APPENDIX.

THE case reported by Dr. Leigh Spence in the BRITISH MEDICAL JOURNAL of August 28th, 1920, is very similar to one I have just encountered.

Two months ago a man, aged 50, consulted me for deafness and swelling of the eyelids; he had a displaced nasal septum from football in his youth. Until the last six months, when he became rather pallid and sallow and felt languid, he had been a strong athletic man and in good health. Repeated examinations of his urine showed a distinct trace of albumin and pus, and very occasionally a granular cast. His blood pressure (Riva-Rocci), mean or systolic, was not abnormal. His urinary tract was radiographed by Dr. Rowden, with negative results; but during the screening a very dark shadow was seen in the region of the appendix. From the skiagrams Dr. Rowden diagnosed "shot in the appendix." The patient had had no suggestion of appendix symptoms, but on deep pressure over the appendix slight tenderness and rigidity could just be made out. Sir Berkeley Moynihan operated, and removed a long, stiff, and swollen appendix containing twenty-one shot (No. 6). The appendix was free and movable. The mucosa was congested and thickened, and about to ulcerate in the region of the most distal half-inch, but there was nothing abnormal about the appearance of the mouth of the appendix or Gerlach's valve. The shot were in the distal half of the appendix, and gave it a fusiform outline. The pathologist's report on his blood while he was in the nursing home revealed nothing except a slight degree of anaemia, and the report on the urine showed no deficiency of chloride excretion, no casts, but a small amount of albumin and pus. His recovery after the operation was painless and rapid, and his colour and appearance are now much improved. Weekly examinations of his urine during the last six weeks have only once shown a trace of albumin and pus, and make me wonder if absorption of lead might have caused his condition.

From the state of his appendix at the time of the operation it seems remarkable that the patient had had no definite symptoms attributable to it; it was a lucky chance that it was discovered in time. He had eaten largely of game for many years.

Leeds. R. H. HALL, M.A., M.B.Camb.

Reports of Societies.

EFFECTS OF EXPOSURE TO RADIUM BROMIDE.

AT a meeting of the Section of Pathology of the Royal Society of Medicine, held on October 19th, the President, Professor W. S. LAZARUS-BARLOW, M.D., delivered an address upon "Some pathological effects of exposure to the gamma rays of 5 grams of radium bromide." The large quantity of radium in question had been entrusted to Professors Lazarus-Barlow and Russ and the late Mr. Cecil Lyster for experimental purposes at the Middlesex Hospital. The entire report will be presented, when completed, to the Medical Research Council, by whom the loan was made, and by whose courtesy the present interim communication was possible. For the results now brought before the Section Professor Lazarus-Barlow alone was responsible. They were derived, in the main, from the histological examination of 20 frogs, 28 rats, 15 rabbits, and 9 cats. The address was illustrated by macroscopic and microscopic specimens and by lantern slides.

In respect of the lethal effects of gamma rays, it appeared that primary and secondary changes in the animal must be distinguished. A rat would die, if exposed continuously to the 5 grams, in about forty-eight hours, but he would also die about forty-two hours after an exposure of six hours. Making allowances for distance from the source of irradiation, the minimal lethal dose of gamma radiation from this quantity of radium for the rat was about six hours, for the rabbit nine to ten hours, for the cat five hours, and for the frog some ninety-six hours. Marked changes were seen in the blood, notably a diminution in number of lymphocytes. This was to be correlated with the presence of much nuclear débris in lymphatic glands and spleen in cases killed immediately after exposure, and with a marked cellular deficiency in the same organs in animals that had survived some days. This disappearance of cells was associated with a measurable diminution in size of the spleen. Hence it was now necessary to add irradiation to pressure and to disuse, as a cause of atrophy. Erythrocytes also diminished in number, and haemorrhages occurred in gastric and intestinal mucosae and in bone marrow. To a large degree the blood changes in animals were reflected in man.

In striated muscle a deposition of lipoid and loss of striation were sometimes noted, and a translucency of fibres was frequent. In unstriated muscle a vacuolation was not uncommon that generally affected the contractile material but also involved the nuclei. Cardiac muscle usually showed no change unless the exposure was very severe, but under this condition translucency of fibres, loss of striation, and great fragmentation might be found. In liver, nuclear and cytoplastic changes were often present. The nuclei might be ghost-like, or represented by no more than a few granules of chromatin, and the cytoplasm might disappear almost entirely. The two conditions were apparently independent, and it was frequent—in liver of animals or in new growths of man after exposure to this high degree of gamma irradiation—to find the cells represented by a well marked cell membrane and a well marked nucleus, with a considerable space between the two. In kidney, the cells of the convoluted tubules were chiefly affected. In the cat—but in none of the other animals examined—the renal cells in this region were almost completely converted into lipoid, but the glomeruli and the cells of the conducting tubules showed no trace of lipoid. In the frog, the glomerulus seemed to be changed to the greatest extent. Over the gastro-intestinal tract there was widespread disintegration of the mucosa

associated with pronounced formation of mucus. The disintegration concerned the duodenum, jejunum, and upper part of ileum in particular, and the increased formation of mucus concerned the colon and rectum, and, to some degree, also the stomach.

Our knowledge of the effects of *x* rays upon the generative system would lead to the supposition that testicle and ovary would be profoundly affected by the large degree of irradiation in question. In point of fact this was not the case. There was an arrest of spermatogenesis and some impaired staining of spermatozoal heads in the male; and, in the female, the primordial ovules and Graafian follicles appeared to be the seat of a change resembling coagulation necrosis. But these effects were not associated with pronounced histological features. Probably the explanation lay in the relatively short survival of animals that underwent a prolonged exposure to the 5 grams of radium bromide.

OBSTETRICS AND GYNAECOLOGY.

At a meeting, held on October 7th, of the Section of Obstetrics and Gynaecology of the Royal Society of Medicine, the President (Professor Henry Briggs) read a short communication on a spoon-shaped, depressed fracture of the right frontal bone treated by elevation. He had recently been associated with Dr. W. McIntyre Brown and Mr. Craig Dun in the treatment of a female child which, after instrumental delivery, weighed 9 lb. and on the seventh day showed a spoon-shaped fracture of the right frontal bone, 2½ in. by 1½ in., and ½ in. deep. There were no signs of cerebral pressure or irritation; the bulk of the depression was below the hair level and produced a most unsightly deformity.

Since no spontaneous elevation had occurred during three weeks Mr. Craig Dun decided on operation. Under ether two half-inch incisions were made in the upper part of the frontal bone, on either side of the depression, so that both lay in the hair-covered area. The incisions passed through the scalp and the thin membranous bone, which was easily cut with the knife. By means of two flat-bladed periosteal detachers, slightly curved upwards towards their ends, and inserted simultaneously through the incisions, the depressed bone was levered up. The small skin incisions were closed with a few horse-hair sutures.

No shock nor signs of cerebral disturbance followed the operation. Healing of the incisions occurred normally, and the result was most satisfactory.

Dr. McNair described a case of placenta praevia with vasa praevia, delivered by Caesarean section.

The patient, aged 39, was admitted to Guy's Hospital for haemorrhage in the thirty-fifth week of her hitherto uncomplicated first pregnancy. She was first seen by Dr. McNair after a plug had already been inserted in the vagina, the membranes having already ruptured. The patient was blanched and the pulse rate 140; the presentation was a vertex, and the fetus was alive; the cervix was rigid and dilated only to one finger, and a marginal placenta praevia was felt. Haemorrhage was profuse, and, after considering alternative methods of treatment, Dr. McNair decided to perform Caesarean section under gas and oxygen anaesthesia. The child was delivered in a condition of white asphyxia from which it was resuscitated, and mother and child subsequently recovered. Examination of the after-birth showed that with a marginal placenta praevia there was a velamentous insertion of the cord so disposed that the spread-out vessels lay over the internal os, and also that the rupturing of the membranes had resulted in the tearing of a large vein.

The survival of the fetus was regarded as remarkable.

Professor J. M. Munro Kerr gave a short communication on the surgery of uterus bicornis unicollis, with a case of resection of the uterus followed by two normal pregnancies. After describing two cases of asymmetrical bicornual uterus, he discussed the variety of this malformation in which the two halves were symmetrical. He drew attention to the plastic operation for the condition, and recorded a satisfactory case of his own where resection was followed by two pregnancies.

The patient had had two abortions, and after the second curettage he obtained her permission to resect the uterus, as he had found on examination that the two halves were symmetrical. He excised a portion of each horn, and carefully stitched the two halves together. Some months later the patient became pregnant, with a first stage of labour lasting eighteen hours. When the second stage had continued for two and a half hours the patient was delivered with forceps, for fear of a rupture, but the pelvis was flattened and delivery difficult; the child was born asphyxiated, and lived only twelve days, dying as a result of cranial injuries. Professor Munro Kerr inserted his hand into the uterus to determine the condition of the cicatrix, and felt a longitudinal ridge running vertically along the anterior and posterior uterine wall.

Professor Munro Kerr described the technique of the operation, which could only be performed when absolute symmetry was present. The suture used for the principal stitches was linen thread, and for the intermediate stitches fine catgut. Professor Munro Kerr also gave a communication on the intravesical repair of inaccessible vesico-vaginal fistula.

Professor Briggs then delivered the President's address, taking as his subject "The female pelvic floor." He reviewed the past literature on the subject, and lucidly epitomized the views of Hart, Symington, and Thompson. He disagreed with the former writer's view that the rectum and bladder should be considered as parts of the pelvic floor, and deprecated the tendency to belittle by exclusive advocacy of any one constituent the harmonized co-operation of all the constituents of the pelvic floor.

STERILITY IN WOMEN.

At a meeting of the West London Medico-Chirurgical Society, held on October 8th, a paper was read by the President, Dr. F. J. McCann, on "The prevention of female sterility." He said that the observant family practitioner, from the nature of his calling, was destined to play a most important part in the study of the beginning of disease, the influence of heredity, habits, and environment. The potency of the male as regards coition and fertility should always be ascertained before treatment of the female was begun. The principal cause of male sterility was gonorrhoea, a preventable disease. Sexual incompatibility could neither be foreseen or prevented. Possibly the spermatic fluid was more than a germinating fluid and helped to bring about that evenly balanced interaction between the endocrine glands which favoured fertility. The failure to bring about this interglandular equilibrium might be the explanation of sexual incompatibility. Improvement of the general health, change of scene, of diet, or habits, were often of service in curing sterility. Extreme leanness and obesity, too, were sometimes factors favouring sterility and should be treated. Alcohol, though stimulating sexual desire, often interfered with the proper performance of the sexual act, apart from the far-reaching effects on the internal genital organs—for example, chronic metritis. Gonorrhoea was a potent cause of sterility in women. The speaker supported those who urged prophylactic measures, and referred to the thoroughness with which these measures were employed in the American army. If efficiently carried out the case for prophylaxis was overwhelming. Syphilis, though not a direct cause of female sterility, was a formidable destroyer of infant life and was largely a preventable disease. In connexion with gonorrhoea, women should be taught that the use of the syringe was dangerous, and medical men should remember that in the presence of this disease the passage of a uterine sound or curettage was also dangerous. When the abdominal ends of the Fallopian tubes were sealed, they could be opened up and fertility result. In properly selected cases this operation yielded gratifying results. When uterine or ovarian tumours were encountered in association with sterility, conservative measures should always be employed. Tuberculous infection of the tubes and ovaries was another potent cause of sterility, and much could be done to prevent this result by early treatment. Involvement of the uterine appendages in infections of neighbouring organs—for example, appendicitis and sigmoiditis—was yet another often preventable cause of sterility. The speaker urged early operation for these conditions before the tubes became occluded or the ovaries involved beyond recovery. Menstrual disorders should be treated early, as they were frequently due to causes easily removable, which, if neglected, often resulted in sterility. Sexual excess must be discouraged, and so also should the various means of preventing conception; these were all injurious to the female. The rare examples of true congenital malformation of the genital organs should not be overlooked; sterility due to these causes was of course incurable.

TREATMENT OF CHRONIC NON-INFECTIOUS DISEASES.

THE first meeting of the session of the Sheffield Medico-Chirurgical Society was held at the University on October 14th, when Dr. F. J. SADLER, Physician to the Beckett Hospital, Barnsley, delivered the presidential address on the treatment of chronic non-infectious disease by modern methods. Dr. Sadler first referred to the importance of the diagnosis and treatment of chronic intestinal poisoning in its earliest stages. Following the recent writings of Danysz, the treatment was discussed under three headings: (1) The discouragement of the intestinal flora, whose excess or increasing virulence was the source of the toxins which did the damage, by the administration of intestinal antiseptics—for example, ichthyol, salol, benzo-naphthol, in addition to purgatives. (2) Neutralizing the poisons which had passed into the blood by injecting various forms of protein, whether intravenously or otherwise. (3) Making good an endocrine insufficiency, which might be the first cause of departure from health, by the administration of thyroid, suprarenal, or other endocrine gland extracts.

The value of intestinal antiseptics was illustrated by reference to numerous cases, one of which, a case of chronic parenchymatous nephritis, was described in detail. The albuminuria diminished and the general state improved during the administration of ichthyol in 2½ gr. doses twice daily, this treatment having been started only when improvement had ceased under the ordinary methods. The treatment of arthritis, sciatica, lumbago, neurasthenia, and chronic dyspepsia by doses of 10 to 50 million of killed *B. coli* had given satisfactory results, but had failed in a case of chronic nephritis in which ichthyol did good. Numerous instances were given in which the administration of thyroid extract had proved most satisfactory, more especially cases of neurasthenia, and climacteric disorders of women. In a number of cases of deafness this treatment had also brought about material improvement. In many cases a combination of these various methods had been found to give the best results.

THE Leeds and West Riding Medico-Chirurgical Society held its first meeting of the new session at the General Infirmary, Leeds, on October 15th. The opening address was delivered by the President, Dr. F. H. MAYO, who dealt with some of the advances which had taken place in the practice of medicine during his own experience, and concluded by a reference to some of the problems which confront the profession in connexion with the proposed scheme for public health as outlined in the interim report of the Consultative Council. A hearty vote of thanks to the President for his address was passed, on the motion of Dr. BARRS, seconded by Dr. C. RICHARDSON. A number of interesting cases and specimens were shown, including a specimen of fused kidneys situated in the right renal pouch, exhibited by Professor M. J. STEWART and Mr. S. D. LODGE. The kidneys possessed separate pelves and ureters, the ureter of the lower kidney opening into the bladder in the normal situation of that of the left kidney.

THE annual meeting of the Pathological Society of Manchester was held in the Department of Pathology, Manchester University, on October 20th. Dr. A. SELLARS took the chair on election as President for the year 1920–21, and expressed the hope that the society would play an increasing part in bridging the gulf between the whole-time pathologists and those engaged in clinical work. After the election of officers for the coming session, Professor DEAN demonstrated specimens from a case of carcinoma of the bronchus, with secondaries in the heart and subcutaneous tissues. Mr. GARNETT WRIGHT showed a primary carcinoma of the liver removed by operation. Mr. GEOFFREY JEFFERSON demonstrated a specimen of traumatic rupture of the pelvis of a hydronephrotic kidney of uncertain origin in a boy aged 7, and Mr. JOHN MORLEY showed two specimens of adeno-sarcoma of the kidney removed from young children.

ACADEMIES of social hygiene for the purpose of instructing medical men in public health, school hygiene, and allied subjects, are to be established at Breslau, Charlottenburg, and Düsseldorf.

Reviews.

THE "NEM" SYSTEM OF NUTRITION.

FOR English readers, and indeed for all medical and scientific readers, the chief interest of the textbook of nutrition,[1] recently published in Vienna by Professor VON PIRQUET and Dr. MAYERHOFER, will be the sections dealing with the "Nem" system of nutrition and its successful and economical application to the feeding of large communities, children or adults, in Austria. The book, which is concerned with all aspects of feeding, especially from the practical standpoint, consists of ten separate sections, each from the pen of Professor von Pirquet or of one of his colleagues. A short summary of the physiology of nutrition is contributed by Dr. E. Mayerhofer, who also gives a full descriptive account of all articles of food commonly consumed in Central Europe—their origin, method of preparation, conservation, and adulteration. The remaining chapters of the book describe the way in which the "Nem" system has been applied to cope with the food deprivation and under-nutrition in Vienna. The organization of a kitchen arranged to feed 10,000 children daily with a meal of fixed calorie value is described by Dr. Nobel and Frl. Helene Czimeg. Dr. Richard Wagner gives particulars of the method of control by which cooked dishes are sampled and analysed for fat content and dry weight. Other experts deal with the general control of food supplies for mass feeding and with the installation of large kitchens, the "Nem" system pervading all.

The principles upon which Professor v. Pirquet's "Nem" system is based are well summarized in a short chapter by Dr. E. Nobel. It was described fully in the three volumes of Professor Pirquet's *System der Ernährung*, published respectively in 1917, 1918, and 1919, but this book does not appear to have been noticed by many English readers, and it may not be out of place to recapitulate the salient points of the system. The "Nem" system may be described as a series of practical measures by means of which the feeding, whether of the individual, the family, or the community, may be regulated in strict accordance with the energy requirements. Such a system, therefore, naturally divides itself into two sections: (1) Determination of the energy value of the food as consumed, and (2) determination of the energy needs of the individual at all ages and under all circumstances. Professor Pirquet, for various reasons, has adopted a new unit of energy value of food in place of the calorie—namely, the "Nem," which is the energy value of 1 c.cm. of milk (0.66 calorie). The word is an abbreviation of "*Nahrungs Einheit Milch*" or "*Nutritions ElementuM*." It is immaterial whether 1 c.cm. of cow's milk or of human milk be regarded as the unit, since the two fluids are approximately equivalent in calorie value. The apology given for the invention of this new unit is that the concept of the calorie is too abstract and too difficult of comprehension by ordinary people without scientific training, and it is by such people that the system must be adopted and used, if at all. The "nem" represents the food value of something that can be seen, handled, consumed. The working unit for practical purposes becomes a "hectonem" = 100 nem, and can be visualized as a small cupful of milk. In this system the idea of concentration is also impressed upon the student. Milk being the unit, the cook learning the new system is led to realize that a milk pudding made from ½ litre of milk and 40 grams of rice or other cereal possesses twice the food value of the original milk, and that the addition of 35 grams of butter will treble it. Tables have been constructed giving the "nem" value per gram of all the ordinary articles of food and of many prepared dishes made from standard receipts. The relative prices of all foods in comparison with their fuel value have also been tabulated and reproduced in diagrams, so that the cost of a "hectonem" of various foods can be seen at a glance.

As regards the qualitative value of different kinds of food, two classes only are distinguished, protein as building

[1] *Lehrbuch der Volksernährung nach dem Pirquetschen System.* Bearbeitet von J. Heussler, E. Mayerhofer, Frau R. Miari, E. Nobel, Franz Oberleitner, Cl. Pirquet, R. Schneeweiss, R. Wagner. Herausgegeben von Priv. Doz. Dr. E. Mayerhofer und Prof. Dr. C. Pirquet. Wien und Berlin: Urban und Schwarzenberg. 1920.

material and carbohydrates and fats as fuel. The two last named are regarded as interchangeable, fat being regarded as an expensive and unnecessary luxury if the calorie equivalent of sugar or cereal can be obtained. Protein, it is held, should always compose at least 10 per cent. of the total nems consumed.

The energy requirements of the individual are calculated in relation to his sitting height (SH), according to the simple relations, deduced by Pirquet, between this measurement and body weight upon the one hand and the surface of the alimentary tract upon the other. According to Henning and others, the length of this tract = 10 SH and the mean width may be computed at 1/10 SH; the surface, therefore, is = SH^2. This value, termed the "*Ernährungs-fläche*," is another conception which it is found can easily be grasped by the simple student. This number of square centimetres, expressed as nems, forms the basis of calculation for the daily need in food of the individual. The minimum amount required for an adult lying in bed is 3/10 SH^2 nem; for sedentary and quiet occupation 5/10 $(SH)^2$, and according as less or more hard manual work is required, the food intake must supply 7/10 SH^2 up to 10/10 SH^2 nem. The optimum daily allowance for young children, to allow for satisfactory growth, in addition to daily fuel requirements and repair of tissues, has been fixed at 7/10 $(SH)^2$ nem. All classes of the population have been divided into "*Ernährungs Klassen*," according to their food requirements. A man with 80 cm. sitting height, if lying quietly in bed, would need 3/10 × 6,400 nem = 1,820 nem (1,210 calories) daily; if up and about doing light work 5/10 × 6,400 = 3,200 nem; and if on hard manual labour, 6,400 nem (4,300 calories). An infant six months old, of sitting height 40 cm., would require daily for optimum growth 7/10 × 1,600 nem = 1,120 nem (750 calories), or 1,120 c.cm. milk. Examination of large numbers of individuals has shown that under conditions of good nutrition the sitting height raised to the third power is equal to 10 × the body weight (W) expressed in grams.

$$(SH)^3 = 10\ W \text{ or the ratio } \frac{\sqrt[3]{10\ W}}{SH} = I.$$

This ratio, known as the *Gelidusi*, is taken as indicative of the state of nutrition of the subject. The normal value should be in the neighbourhood of 1.00, and values less than 0.93 signify distinct under-nutrition.

The nem system is an invention against which a good deal may be said in theory. A substantial excuse will be demanded for the invention of a new unit of fuel value to replace the well-established calorie. Many physiologists also will deny the possibility of all fat in a diet being satisfactorily replaced by carbohydrates or sugar, and will regard this idea, conceived during a period of severe fat deprivation, as born of necessity. The system will also receive all the more opposition at the present time since the discovery of the fat soluble vitamine has shown the importance of certain fats for the diets of the young growing animal. The modern conception of accessory factors and their importance in diet is, however, new in Central Europe, where the knowledge of the subject stops at the classic researches on beri-beri, which comprised most of the knowledge available in 1914. The vast mass of the work upon this subject published in England and America during the war has not been available for Austrian readers, and even at the present time some journals containing these investigations are out of reach owing to the depreciation of their currency. This is a good example of the difficulties in which the medical and scientific professions in Vienna carry on their work.

No one, however, who has seen anything of the "nem" system in application can deny that it has been and is a brilliant success in practice. For example, Professor Pirquet and his colleagues have been responsible for the organization of the American child feeding in Vienna, which involves the provision of at least one meal daily for 160,000 children, and is run throughout upon the "nem" system. There is no doubt that the system can easily be grasped by the ordinary well-educated person with no previous knowledge of medical or scientific subjects. One of the most important links in the system as applied to communal feeding in Vienna are the "Nem Damen," young women of good education who have taken the "Nem Kurs" at the University-Kinderklinik and passed the examination. Picked examples from this ever-increasing class are found in charge of the kitchens, where food is cooked for 10,000 and more meals daily, with strict regard to all quantitative measurements, with a maximum efficiency and with the simplest of organizations. The food is of excellent quality, is appetizing, and well cooked; each child over ten receives a portion of 1,000 nem (660 calories), under ten of 500 nem. The American child feeding in Vienna is a model of organization which would repay careful study by all those interested in school or other communal feeding.

The children receiving the free meals are selected from the schools after a medical examination in which determination of the *Gelidusi* is the most important part, values under 93 admitting any child without further examination. The condition of nutrition of the children in Vienna last spring may be gauged from an example given on page 278. Examination of 501 out of the 669 girls from a middle-grade school showed that 372, or 70 per cent., had a *Gelidusi* of less than 93.

The nem system in its most perfect expression can be studied best in the University Kinderklinik in Vienna, of which Professor Pirquet is the director. Here the entire diets of all the children are controlled in this way. A large ward of convalescent tuberculous children between the ages of 6 and 14, who lead a moderately normal life, is the most interesting example. The kitchens of the hospital, including the "milk kitchen" where the food of all infants is prepared, are presided over by expert sisters; all cooking is done on strict quantitative lines, so that the exact composition and calorie value of every cooked dish are accurately known. These kitchens serve as schools for teaching this branch of the nem system, and much of the time devoted to the training of the "Nem Damen" in the "Nem Kurs" is spent in these admirably managed kitchen laboratories.

NOTES ON WAR INJURIES.

In *Chapitres Choisis de Chirurgie*[2] M. Regard has done what many of us would like to do. He has written a book on the interesting cases that he saw during the war, the impressions that they made upon him, and the ideas they gave him. M. Regard has a catholic and a receptive mind; he has imagination, he has industry. Possessed of such qualities, the book before us cannot but be original. The author served with all manner of units; he has been everything from battalion medical officer to surgeon in a military hospital. In the course of his peregrinations he took notes of all cases of interest, and it is upon these that the book is founded. M. Regard opens with an account of some cerebral injuries. He is, however, only interested in these so far as they support a theory of cerebral commotion and contusion which he has formulated. According to this theory, the cranial contents are not only incompressible as water, but behave very much like it. Waves dance to and fro when the head is struck, breaking on the rocks (the basal ganglia) and beating against the cliffs (the falx and tentorium). However much or little there may be in this, M. Regard is correct in saying that the fissuration which occurs in many wounds of the brain is difficult to understand. We have next an account of the very successful removal of a rifle bullet from the lateral ventricle. The author believes that a projectile rarely comes to rest fairly and squarely within a ventricle; the more common method of entry is a slow progress; at first the missile only projects into the cavity, and works its way into it subsequently. M. Regard has had the good fortune to see a case of paralysis of the spinal accessory nerve occasioned by a fracture of the base of the skull, an uncommon complication.

After some remarks on shock, from which it appears that he believes it to be a complex phenomenon, the author passes on to the treatment of wounds, auto-vaccines, dyspnoea in gas gangrene, lesions of vessels. Under the last caption he coins a phrase, "hémorragie d'alarme," to denote the warning haemorrhages which are often the precursor of a severe and dangerous outburst of blood—especially if the source is a newly-formed aneurysm. He has something to say on osteogenesis, on the treatment of certain fractures, on the survival of bone grafts, on the resection of joints, and on amputations.

[2] *Chapitres Choisis de Chirurgie.* Par G. L. Regard. Paris: A. Maloine et Fils. 1920. (Roy. 8vo, pp. 429; 40 figures, 10 plates. Fr. 20.)

It will be gathered that M. Regard has, in the realms of surgery, "many goodly states and kingdoms seen." Although one cannot always agree with him, the account of his journeyings is not without a certain freshness. As in so many French writings, there is a lamentable lack of any reference to the English literature of the many subjects discussed.

ELECTRICITY IN DIAGNOSIS AND TREATMENT.

The *Atlas for Electro-diagnosis and Therapeutics*,[3] compiled by Dr. F. M. de Laroquette, has been translated into English by the late Miss M. G. Cheetham, and published with a eulogistic foreword from Dr. Robert Knox. The author is the chief of the electro-radiological service of North Africa at Algiers, and has aimed at placing before the profession an atlas-manual, in which are presented, in such a way as to be seen at a glance, the normal anatomical data that should be well in the mind in order to conduct an electro-diagnosis, or to draw any conclusions from it. Following a short description of the sensory motor nerve paths, the main portion of the atlas, profusely illustrated, deals with the muscles and nerves of the head and trunk, of the upper and of the lower limbs. There are two diagrams of each portion of the body under consideration, one showing the motor points of nerves and muscles as on the skin, and the other the muscles with their nerve supply and motor points with the skin, etc., removed. In the accompanying letterpress is given the origin and insertion of each muscle, its nerve supply, the motor point, and the average intensity in milliampères of the galvanic current required for obtaining the normal negative and positive closing contractions. There is a short chapter on the normal excitability of nerves and muscles, tables to show the normal coefficient, and a few other tables showing variations brought about by injury, etc. Everything is arranged in a very simple manner, the essentials are easily seen, and for easy reference this portion of the book should be invaluable. An interesting feature of the concluding portion, in which the various articulations are dealt with *in extenso*, is the use of radiographs for illustrative purposes. On each radiograph the lines of action of the various muscles are indicated by means of arrows and dotted lines. Taken as a whole this atlas-manual fulfils its purpose admirably. The illustrations are good and well chosen. The translation has been done very well indeed. As a handy book of reference it should find its place in every electro-therapeutic department, and in the library of all specialists in this department of medicine.

Electro-therapy: Its Rationale and Indications[4] is the title of a short and concise book by Dr. J. Curtis Webb which has been written with the hope that it may find its way into the hands of medical men who themselves, perhaps, will never apply these treatments, but who should be in a position to know when their patients may be benefited by physio-therapy. This being the main object, it follows that all description of apparatus, and also descriptions of the actual methods of application, are practically entirely left out; and the reader is spared what is so usually a feature of books of this kind, namely, reproductions of numerous illustrations from the catalogues of instrument makers. The author starts with a chapter on theory and electrical treatment; its mode of action, according to this, is regulated by these two fundamentals: (1) a change of vibration in nerve tissues, end organs, etc., set up by vibratory influences from without will alter the amount of neuro-electricity flowing along a nerve—that is, its conduction—and will consequently set up changes in nerve impulses and in the functions of the organs supplied; (2) by subjecting nerve tissues to suitable currents a change of vibration-rate can be brought about, thus altering the amount and rate of flow of the neuro-electricity. The remainder of this first section deals with continuous and interrupted currents, high-frequency and diathermy currents, static electricity, radium and *x* rays, in separate chapters, and some idea of the scope and conciseness may be gathered when it is realized that a chapter of three pages is found sufficient for radium and one of one page for *x* rays. Seven diagrams—the only illustrations—appear in this part of the book. Part II is designed to indicate the various morbid conditions which may be benefited by one or the other methods of electrical treatment, and it is expressly stated that only those diseases are mentioned for which "it has been proved" that electro-therapy can offer something superior or an addition to the ordinary treatments advised in textbooks of medicine. Some 120 to 130 different conditions are enumerated as being suitable for these methods of treatment and the method considered most suitable for each condition is stated.

[3] *Atlas for Electro-diagnosis and Therapeutics.* By F. M de Laroquette, M.D. Translated by Mary G. Cheetham. London: Baillière, Tindall, and Cox. 1920. (Demy 8vo, pp. 196; 52 plates. 15s. net.)

[4] *Electro-therapy, its Rationale and Indications.* By J. Curtis Webb, M.A., M.B., B.C.Cantab. London: J. and A. Churchill. 1920. (Cr. 8vo, pp. 90; 7 figures. 5s. net.)

NITROUS OXIDE–OXYGEN IN CHILDBIRTH.

Painless Childbirth[5] is the title of a small book by Dr. C. H. Davis of Chicago, which purports to introduce "an improvement on twilight sleep"—to wit, the use of nitrous oxide–oxygen analgesia. This method of relieving the sufferings of parturition is, of course, by no means new, but Dr. Davis's little book is interesting as giving the personal impressions of the writer after a fair experience of it. That experience has made him an enthusiast, but it does not appear that he has had an equal opportunity of trying the scopolamine-morphine method, and his claim that the gas method is an improvement on the latter is largely based on the statements of others as to its drawbacks.

Apparently the only drawbacks to the use of nitrous oxide–oxygen are the necessity of using an apparatus that is heavy and cumbersome, and the need of close and continuous personal supervision by the obstetrician. To have to carry a gas and oxygen apparatus from case to case will be almost like the old days of the obstetric chair! But the second objection can, it is said, be overcome to some extent in the case of intelligent patients, who can learn to give themselves a sufficiency of the gases to maintain a complete and perfect analgesia throughout. The number of cases upon which Dr. Davis's enthusiasm is based is not large enough to be very convincing as to the full measure of his claims, but the record is quite satisfactory as far as it goes. It is to be hoped that the method will be tried widely and without prejudice by scientific obstetricians, and that it may reach its proper level without the blundering assistance of the Sunday papers or the American monthly magazines.

To be frank, however, this little book makes one dubious as to this last aspiration, for in its arrangement and general "get up" it appears to be aimed almost as much at the lay public as at the medical profession. At least it is difficult otherwise to explain the devotion of a page to the definition of such common terms as analgesia, amnesia—and not only their definition and etymology, but careful instructions as to their pronunciation. Fifty per cent. of the letterpress is also more suitable for consumption by an impressionable laity than for the instruction of the profession. Chapters on the development of anaesthetics in general, and on puerperal sepsis, are not germane to the main thesis of the book, if it be directed to the medical profession, and they merely serve to obscure the point.

A desire to make short cuts through the English language may explain such sentences as the following: "Patients may precipitate (*sic!*) while under the analgesia without knowing that the baby is being born"; but for such a remark as, "From a long experience of nitrous oxide I doubt of its being *this safe* . . ." there can surely be no excuse.

ZOOLOGY FOR MEDICAL MEN.

Mr. Borradaile's *Elementary Zoology*,[6] first published in 1912 and now in its third edition, is becoming widely used as an introduction to one of the sciences of which every medical man must have at least some knowledge. His book is written for students commencing the study of zoology, those working for the first M.B. among others,

[5] *Painless Childbirth.* By C. Henry Davis, A.B., M.D. London: George Routledge and Sons, Ltd. 1920. (Cr. 8vo, pp. 159. 5s. net.)

[6] *A Manual of Elementary Zoology.* By L. A. Borradaile, M.A. Third edition. London: H. Frowde, and Hodder and Stoughton. 1920. (Cr. 8vo, pp. xviii + 616; 21 plates, 420 figures. 18s. net.)

but he does not attempt to deal with the animals included in any particular schedule. The first animal to which attention is directed is the frog, and this is wise, if only because, for the beginner, the technical difficulties of examining such a form as Amoeba are considerable. The frog, and all the other types chosen, are considered from many standpoints, but no opportunity is lost of illustrating some general biological principle. After a full consideration of the frog and its histology the author reviews all the types usually chosen in works of this nature, together with others, such as the nematodes and platyhelminthes, as illustrations of parasitism, and Obelia, one of the compound hydroids, as an introduction to a discussion on individuality among animals. There is a useful chapter on the embryology of amphioxus, the frog and the chick, and a number of more general chapters on the human parasitic protozoa, reproduction and sex, classification, evolution and heredity, and the relation between the organism and its environment. These are among the best chapters, but it is to be doubted whether the medical student will read them; his curriculum is very full, and they are not on his schedule; when we remember that he can hardly hope to be in a position to earn his living until he is 25, if then, we can hardly blame him if he passes them by. In our opinion the biological training given to medical students in this country is fundamentally wrong. The detailed study of some half-dozen types from the anatomical standpoint, and the committing to memory for the time being of the exact segmental position of the spermathecae of the earthworm, or the distinguishing characters of the maxilla of the crayfish or cockroach, is neither good zoology nor a useful foundation for a study of man. On the other hand, many medical men have very little acquaintance with that part of zoology which most closely affects them, and in which the student's interest could be aroused. Instruction should be given in such matters as heredity, the transmission of acquired characters, variation and evolution, and the student should be introduced to the Protozoa, the Nematodes, and Platyhelminthes. A certain number of types—the frog and rabbit—should be dissected as introductions to human anatomy, but the Invertebrates not so much for the sake of their pure anatomy as because they afford admirable illustrations of broad principles; the earthworm and cockroach should, for instance, be regarded as diagrams of segmentation, and the Amoeba as a type of generalized cell. We are grateful to Mr. Borradaile because, within the limits which bind him, and which bind also all biological teaching to elementary medical students at the present time, he has, as far as possible, interwoven the teaching of these principles with his description of the selected types, and we think that were the regulations brought more up to date he would be able to write a still better book. His facts appear to be accurate and clearly expressed, his index good and his illustrations admirable.

Professor Gamble's revision of Marshall and Hurst's *Practical Zoology*[7] is such a book as the student will have by his side in the laboratory, and there is no doubt that he will appreciate it. It was first published in 1887, and is now in its ninth edition. We feel, however, that it should hardly be needed except by the student dissecting alone; in the ordinary elementary laboratory such a book is most often seen in the hands of the man who crams his work and is for ever calling upon the demonstrator. As long as he has this well known work by his side he will, it is true, have small need of the demonstrator, but he will never acquire the truly scientific spirit of Rikki-tikki-tavi. Of its rather matter-of-fact sort, the book is of course thoroughly sound; it describes the anatomy and dissection of a large number of types, and contains some excellent information on methods of fixing, staining, and drawing, and on the cutting of sections and similar matters. It is curious to find in a book that has been revised so many times a reference to the "sporozoa or gregarines," as if the terms were synonymous, the use of "encystation" for "encystment," and mention now of the "meganucleus," now of the "macronucleus"; unless one word is used consistently the student will certainly think that the two words refer to different things.

[7] *A Junior Course of Practical Zoology.* By the late A. M. Marshall and the late C. H. Hurst. Ninth edition. Revised by Professor F. W. Gamble. London: John Murray. 1920. (8vo, pp. xxxv + 517; 94 figures. 12s. net.)

SYPHILIS IN BRONCHITIS WITH EMPHYSEMA.

In a recent critical study[8] of chronic bronchitis with apical sclerosis of the lungs and emphysema, Dr. Dalsace of Paris draws attention to the frequency with which syphilitic infection rather than the commonplace tuberculosis may be held accountable for an apical pulmonary fibrosis. He argues that such a patch of fibrosis is very commonly to be found in patients with bronchitis and emphysema, and is inclined to connect the development of the two latter with the presence of the former. While admitting that the majority of these patients owe their apical fibrosis to infection with the tubercle bacillus, he argues that if the sputum is, as often happens, invariably free from tubercle bacilli, the diagnosis of "apical syphilis" should be made rather than that the sclerotic changes should be put down to a previous apical pneumonia or a healed tuberculous lesion.

Dr. Dalsace bases these conclusions, perhaps a little slenderly, on certain *post-mortem* observations he has made, and supports them by a review of much of the recent literature of pulmonary syphilis; he further argues that pleural thickening is not rarely syphilitic in origin.

NOTES ON BOOKS.

The sixth edition of Dr. Dudley Buxton's *Anaesthetics*[9] retains its now well known form and arrangement, but is enlarged and considerably altered. In his preface the writer refers to the effect of war experience upon our knowledge of anaesthetics, and this effect is plainly shown in the pages which deal with the treatment of shock as well as elsewhere. Dr. Buxton regards as the dominating factors of shock depression of circulation and diminished oxygen supply to the tissues. He believes, with Keith and Robertson, that there is reduction of the volume of the blood, which is of course exaggerated when haemorrhage is present. In discussing treatment of shock the author says, "The first step is to realize that simple acidosis does not itself cause shock of any kind; the second is to appreciate the fact that the reduction of the alkali reserve follows the circulatory impairment." However, the actual steps which he recommends are the wise measures of maintaining the temperature of the body by hot blankets, etc., and adoption of such a posture as facilitates blood circulation, and ensures the bulbar centres receiving a proper supply of oxygenated blood. During the operation the vapour of the anaesthetic should be warmed and kept moist. Infusion of gum arabic solution is approved of, and a good description furnished of direct and indirect blood transfusion. Warmed oxygen is to be ready for immediate use, and freely employed when required. The chapter on local anaesthetics is particularly well illustrated, full, and practical. An interesting chapter on medico-legal aspects of anaesthetics discusses whether anaesthetics may be administered without consent, and whether they can be administered during sleep, as well as many other points of abstract and practical importance. The lines on "covering" and on responsibility may be especially recommended to the perusal of the young practitioner. Dr. Buxton appears to favour "gas and ether" more than most other methods, though he is obviously catholic in his choice. He recommends the former for the operation of prostatectomy, a proceeding which is more commonly carried out, we fancy, during spinal analgesia, or an open administration, or both together. The author favours preliminary injections of morphine, scopolamine, and atropine, and is not averse to inducing anaesthesia with chloroform after their use. Generally speaking, he does not approve of rebreathing with the use of nitrous oxide, and he does approve of the addition of oxygen to most anaesthetics. This textbook shows throughout the results of experience and of reflection, and it is to be warmly recommended to any student of anaesthetics.

The Universities Bureau of the British Empire has published a new edition of the *British Empire Universities' Yearbook*.[10] Owing to disorganization of the working of the

[8] *Étude Critique de l'Étiologie des Bronchites Chroniques avec Sclérose Pulmonaire.* Par Dr. Jacques Dalsace, de la Faculté de Médecine de Paris. Paris: Félix Alcan. 1920. (Roy. 8vo, pp. 138. Fr. 5.)

[9] *Anaesthetics, their Uses and Administration.* By Dudley Wilmot Buxton. Sixth edition. London: H. K. Lewis and Co., Ltd. 1920. (Demy 8vo, pp. 562; 89 figures, 8 plates. 21s. net.)

[10] *The Yearbook of the Universities of the Empire, 1918–1920.* Edited by W. H. Dawson and published for the Universities' Bureau of the British Empire. London: G. Bell and Sons, Ltd. 1920. (Cr. 8vo, pp. 513. 15s. net.)

universities during the war, no new issue has been made since 1916; for the same reason the present edition records numerous changes in staffs and far-reaching alterations in regulations and courses of study. In sections dealing with each of the forty universities and university colleges in the United Kingdom and of the sixty in the Dominions and Colonies the *Yearbook* furnishes, as well as a list of the staff, information relating to the foundation and development of the institution, its libraries and museums, residential accommodation for students, affiliated institutions, degrees, diplomas, certificates, fees and scholarships, and its regular publications; a summary is also given of new posts lately created and of recent alterations of curriculum. In an appendix outlines are given, so far as the confidential nature of much of the work will permit, of the various forms of non-combatant war service undertaken by the universities; even in their present incomplete state these records describe so extensive and successful a mobilization for war purposes of every kind of special knowledge and every type of trained intelligence that there is much to justify the assertion made that "brains, rather than arms, have been the determining factor in the Great War."

APPLIANCES AND PREPARATIONS.

Forceps for Intratracheal Anaesthesia.

Dr. Ivan W. Magill (Anaesthetist, Queen's Hospital, Sidcup) writes: Following on Dr. Rowbotham's article in the Journal of October 16th on intratracheal anaesthesia by the nasal route, the accompanying illustration of a forceps, made for me by Messrs. Meyer and Phelps for a similar purpose, may be of interest. The forceps are constructed with a bend to clear the field of vision, as in Heath's nasal forceps, the ends which grasp the catheter representing a cylinder split longitudinally and

serrated on the inner surface. Introduction of the catheter into the trachea is carried out with the aid of an electrically illuminated speculum, as in Dr. Rowbotham's method, but I find in the forceps the following advantages over Dr. Rowbotham's guiding rod:

1. There is no injury to the end of the catheter, and therefore no liability of small pieces of the friable material being left in the trachea.
2. The catheter is more easily picked up in the oral pharynx, and once grasped the hold is secure, without the necessity of holding the free end which protrudes from the nose, as is the case with the guiding rod.
3. The forceps can be used at the side of, as well as inside, the speculum.
4. The field of vision is always clear.

I need hardly add that in operations involving bleeding into the pharynx the fixation of a suitable suction pump to the expiratory nasal tube provides even a clearer field for the surgeon by removing blood without continual swabbing.

MEDICINE AT THE UNIVERSITY OF LEEDS.

Dr. T. Wardrop Griffith, C.M.G., professor of medicine in the university and honorary physician to the Leeds General Infirmary, opened the session of the Leeds University Medical Society by an address in which he reminded his hearers that they were students of a university and not merely members of a school of medicine. Although the university was not of ancient foundation, it could be recalled with pride that its germ lay in the old school of medicine founded in 1831. Dr. Griffith continued:

I wish I could see a more intimate association than now seems to exist between the different faculties of the university, both as regards staff and students; one of the dangers which assails those who study and practise medicine is a certain insularity, which I am convinced is contrary to the proper development of our intellect and is not conducive to our happiness or our usefulness. Let us take a wide view of what a university should be and at the same time see what it should not be. Carlyle's opinion that "The true university in these days is a collection of books" can not be accepted, for, besides a good library, a university must furnish that which books alone can not provide—the personal influence of those who guide the studies of the students, or who perform the humbler function of imparting information to them. We require laboratories in the widest sense of the term, and here I include hospitals, with all that they imply; we require facilities which permit and encourage free association between the members of the different faculties—staff and students alike. The functions of a university have been described as comprising the acquisition, the development, and the dissemination of knowledge. Yes, this indeed at least; but one of the imperative duties of a university is to grant its students adequate and reasonable time and opportunity for recreation and athletics. The intercourse and the good-fellowship between the various faculties will be of benefit to the university as a whole, to each separate faculty, and to every individual student. We do not now impose so many lectures on our students; in this, I think, we are wise, but I am not one of those who deprecate this form of teaching.

In such subjects as medicine and surgery no man should try to vie with the text books in the mere enumeration of facts, but by lectures I think that much may be done, and is done, in the way of arresting the attention of the student and guiding him in his reading. Regularity, punctuality, and enthusiasm, on the part of the lecturer must be met, and must be aided and abetted by similar characteristics on the part of the students, but the lecturer must set the example. Under the direction of your teachers in your practical work, in the dissecting-rooms, in the laboratories, in the wards, and in the *post-mortem* room, you must work out your own salvation. Thus you may build up a secure platform for the acquisition of more real knowledge and for the utilization of that which you may already possess. Here I would impress upon you the advisability of associating yourselves with those who are investigating special points in your cases. It is infinitely better that, under the guidance of those in charge of the laboratory of clinical pathology, you personally should make an examination of a urinary deposit, or a suspected sputum, or of a doubtful blood count, than that you should merely await and read the reports of the special investigators. In private practice the cases in which you can call for information from these special sources must be few and will be confined to the opulent; do as much as you can, therefore, for yourselves, and do it now when you can expect and when you will receive willing assistance. While it is right that as students you should utilize every opportunity of obtaining practical acquaintance with the use of special methods and special instruments, the use of the sphygmographs, sphygmomanometers, polygraphs, endoscopes, string galvanometers, and other instruments of precision should in the overwhelming majority of cases be reserved till ordinary methods of investigation have been fully employed. First, there comes the complaint of the patient. He is the only man in the world who knows what his feelings are; let him tell you as best he can, and as far as possible without the influence of leading questions. Then question him as to details with as open a mind as you can, and with that patience which will breed accuracy, but which in the case of a garrulous or obtuse patient may be hard to exercise. Then will come your particular part of the business—the examination of the patient is undertaken; here again I would claim that what we understand by the ordinary methods should have our first attention. It is, for example, better and more conducive to the retention of an open mind that you should not know whether the patient has tubercle bacilli in his sputum or not before you have formed an opinion as to the physical signs in the chest—I do not say until you have made a diagnosis. It is better that by palpation you should try to gauge the size of a man's heart than that you should be biassed by information derived from the fluoroscopic screen. It is better, far better, that you should try to discriminate between the various forms of cardiac irregularity without the knowledge of what is revealed by the polygraph or, with greater authority, by the electrocardiograph. It is true that, until the advent of these instruments and the careful use which has been made of them clinically and in the methods of experimental physiology, our knowledge of cardiac irregularities was imperfect and chaotic; but now that they have been "worked out"—and the field of inquiry appears to be almost complete except as to their causation and in some measure as to their prognosis—my experience is that year by year I become more and more independent of these instruments and their use in individual cases, though, of

course, there are some in which, with our present knowledge, they provide the only source of information. What are termed instruments of precision should be treated as valuable servants and not accepted as masters.

There is probably no more fruitful method of widening knowledge and of confirming its possession than discussion among one's fellows. The discussion which arises on communications put forward with a due regard to verification of facts and clear logical arguments, tends to be conducted on reasonable and constructive grounds. Personally I distrust a man whose criticism is always of the kind that is termed destructive; he never seems to me to have any useful alternative policy, and I suspect him of harbouring the hope that he will be able to say "There, I told you so," while he himself sits ignoble but secure in virtue of the poverty of his constructive faculties. But, on the other hand, I sometimes feel that too sharp a distinction may be drawn between criticism which is constructive and that which is termed destructive, or more usually "purely destructive." It is sometimes necessary to destroy before beginning the work of reconstruction. If, therefore, any of you should find his communications roughly handled in the discussion, let him remember that, as Mr. Asquith has said, "Flagellation in the sphere of criticism is often not only a salutary discipline, but a duty of imperative obligation; and no one but a puling sentimentalist will deny that, in the armoury of a well equipped critic, room must be found for the bastinado and even for the knout."

Your discussions are by no means confined to questions of purely professional interest. This is as it should be. Let your general reading be wide, and try to make it wider as your outlook expands. Even to those to whom reading is a taste which has to be acquired I would say: "Try to develop the faculty, though it be only to a slight extent." Sir Clifford Allbutt, in his opening address given in 1883 to the students of this school, said:

> "You are anxiously charged by all your advisers to keep up your literary attainments. To give such advice is like urging all men to have a taste for music. Some, perhaps most, persons lack an ear for literature. Take up your Bible, or the Collects in the Prayer Book, and read them with a nice attention to the words as well as to the matter. If to power and melody of those words you find any answering delight in yourself, you have an ear for literature, a sense of style. It is a precious possession, and you may well cherish it. If you have it not, you cannot make it, and you had better take your pleasure in the breeding of fox-terriers. You must find comfort in the verdict of the old farmer in Artemus Ward's sketches, who 'never knowed a literary man that knowed anything.'"

A man may be devoid of literary taste, but even for him there is balm in Gilead. Tastes may be developed.

You will find that the happiest life is one that is active and full of varied interests, and that it is well to fight against idleness. There is indeed a time for everything; and, even apart from the hours of sleep and recreation, nature calls for periods of wakeful idleness, when, with or without tobacco, and at a time when there is no desire and no capacity for sleep, the human brain deals not with high problems, but with next to nothing at all. "Sir, you appear to be a very happy old man; I have often wondered how you pass your time," was the remark made to a smooth-browed patriarch, and the reply which was forthcoming was, "Well, sometimes I sits and thinks, and sometimes I just sits." Let those periods when you "just sit" be watched lest they grow upon you, and let that day be far distant when you will wish to say—

> We have had enough of action, and of motion we
> . . . . . .
> Let us swear an oath, and keep it with an equal mind,
> In the Hollow Lotos land, to live and lie reclined,
> On the hills like Gods together, careless of mankind.

THE FALL OF THE BIRTH RATE.

The publication by Mr. G. Udny Yule, to which an incidental reference is made in a leading article on the birth rate, is a print, entitled *The Fall of the Birth Rate*, of a paper he read to the Cambridge University Eugenics Society last May. His conclusions are for the most part based on the statistics for the period ending 1911, the year of the last census. The fall in the birth rate since 1876 amounted roundly to one-third, but there was a countervailing fall in the death rate (including, after 1900, a considerable saving of infant life), so that an increase of population occurred. The fall of the birth rate since 1891 cannot be due to a fall in the proportion of married women to the population, since that proportion has risen; nor to a fall in the proportion of married women of fertile ages, for this proportion also has increased. On the other hand, the effect of the increasing proportion of the population of married women of fertile age may possibly have been nullified by their increasing average age. After full examination of these questions, Mr. Yule comes to the conclusion that the main factor in the fall of the birth-rate has been a decrease in the fertility of married women, and that this fall has been proceeding at an accelerated rate.

This fall is not evenly distributed over all classes of the community. In the Registrar-General's report for 1912 the births in the previous year were classified according to the occupation of the father, which has to be stated at the time of registration. The occupations were grouped into five main classes—Classes 1 and 2 representing broadly the upper and middle classes, and 3 to 5 the manual working classes, graduated from skilled to unskilled labour. These statistics show that, broadly speaking, married fertility is, on the whole, graduated continuously from a low figure for the upper and professional classes to a very much higher figure for unskilled labour, and that the social and occupational differentiation is now much greater than it was half a century ago. There are, however, some marked occupational differences which cut across the social gradation. The fertility of textile workers, for example, is low, falling between Classes 1 and 2, and that of miners is very high, higher than in any other class, agricultural labourers coming next. If the number of children surviving at the date of the census—the effective fertility—be taken for comparison, the difference between mining and agriculture disappears.

The view usually taken to account for the fall of the birth rate is that the decline in fertility of married women is, in the words of Dr. Stevenson, the Superintendent of Statistics in the General Registry Office, "due to increasing practice of contraceptive measures"; this theory only, Dr. Stevenson argues, is consonant with the fact that the decline apparently operated first on the more prosperous and educated classes, and can explain the actual date of the beginning of the fall as it corresponds in time with the opening of the Bradlaugh-Besant propaganda. The decline in the birth rate had, however, begun long before in France, and has been observable in Germany since 1876; there, as in this country, it started in the upper and middle classes and was most marked in the towns; the small family is characteristic of Germans with fixed incomes and is ascribed mainly to the voluntary restriction of families, though a slight decline in fertility and a diminished disposition to marry are recognized as immediate causes. In Germany it is believed that venereal diseases is an important element in the decline of the birth rate; it is estimated that 8 to 10 per cent. of all marriages are sterile or less fertile than they should be owing to the consequences of gonorrhoea, and that in 40 per cent. of sterile marriages the man is at fault. That in France and Germany the main cause of the decline is believed to be resort to contraceptive measures rather weakens Mr. Yule's dissent from applying the same conclusion to this country. He relies partly on some statistics collected by the Birth Rate Commission and by Mr. Sidney Webb, which showed that in the small number of families dealt with the "limited" had more children than the "unlimited." He quotes also inquiries by Dr. Brownlee and himself which afford some support for the view that fertility in a nation is not a fixed quantity, but subject to natural fluctuations. Dr. Brownlee believes them to be physiological and thinks he can detect rhythmic variations in germinal vitality, periods of rapid increase in nations being related with other symptoms of energy, such as remarkable literary output and "racial adventure." Mr. Yule believes that the fluctuations are related to changes in economic conditions, but the inquiry showed that the rise in prices from 1801 to 1911 coincided so nearly with the curve of intercensal population that similarity could not be accidental. The inquiry is very difficult, for, as Mr. Yule points out, though economic causes lead to a rise in the birth rate the infants are not available for economic production for some twenty years or more.

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SATURDAY, OCTOBER 30TH, 1920.

THE FERTILITY OF THE PROFESSIONAL CLASSES.

THAT the birth rate has declined, and that the decline has been greater in the professional than in the hand-labouring classes, are facts which nobody disputes; their interpretation, on the other hand, is matter of controversy. Most statisticians, including Dr. Stevenson and Professor Karl Pearson, have seemed to assign chief importance to the increased use of anti-conceptual methods, but some distinguished authorities, such as Dr. Brownlee and, as appears from his recent paper,[1] Mr. Udny Yule, doubt whether the phenomena can be described in such simple terms. Upon the social and racial consequences there is likewise a cleavage of opinion, as may be gathered from the divergent views expressed by witnesses before the unofficial Commission on the Birth Rate presided over by the Dean of St. Paul's.

The current number of the *Eugenics Review*[2] contains a paper by Mr. J. W. Brown, Dr. Major Greenwood, and the late Mrs. Frances Wood, which analyses in detail some data collected for a committee of the Birth Rate Commission and briefly summarized by Dr. Greenwood in his evidence before that body in 1915. The data relate to the families of nearly 500 women students in universities and to the families of 153 women (usually sisters of the former) who did not receive a university education. The authors address themselves in the first place to the determination of the question whether the women who passed through a university course were less fertile than their less highly educated sisters. They find, in agreement with the earlier results of the late Mrs. Sidgwick, that the whole difference between the actual sizes of family in the two classes may be accounted for by differences in age at and duration of marriage, the university woman marrying on the average a year later than the remainder. So far as actual size of family is concerned, it appears that for marriages commenced at age 26 of the wife and remaining in force to the age of 46, the average number of children would be 4; if the age of wife at marriage were 28, it would be slightly more than 3½. In this sample, as in the Scottish census material, the age of the husband was not a factor of statistical importance.

The writers devote much attention to the subject of artificial limitation and provide a large number of tables; the answers in many schedules were vague, but it is established that at least half of the reporting wives limited, or thought they limited, the size of family. Of the 289 women who gave reasons for limiting the family, 130 (45 per cent.) adduced economic reasons, 90 (31.1 per cent.) spoke of health. Of the methods of restriction used by the 289 wives, in only 98 cases are "artificial" means admitted. In 105 cases, "continence" *sans phrase* is alleged; in 86 no statement was entered.

We now reach the paradox of the inquiry. However tabulated, the "limited" marriages are not less but slightly more fertile than the "unlimited" marriages. For instance, there were 133 marriages of "limited" or "doubtful" fertility which had lasted six to ten years and produced 2.31 children per marriage, or 2.58 when sterile marriages were excluded. The 63 "unlimited" marriages of the same duration produced 1.35 children per marriage, or 2.07 per fertile marriage. The authors remark: "We thought it probable that the result could be explained by supposing that the women who were naturally of greater than average fertility resorted in greater proportion to the use of artificial means and consequently emerged with an about average effective fertility. We have failed to obtain any statistical confirmation of this, either by a comparison of fertilities in the first years of marriage (that is, at an epoch when preventive measures would be less commonly used) or by correlating fertility with restriction for health constant. The schedules did not provide for a statement as to when restrictive measures were adopted, so that an analysis of fertilities before and after the introduction of preventive measures could not be made."

There are evidently three possible explanations of this result. The first (which the authors do not discuss) is that the sample is not a random sample so far as "unlimited" marriages in the middle class are concerned, and that consequently no inference at all should be drawn; the second is that the use of "preventives" is not a primary factor of the declining birth rate; the third is that some of the "unlimited" marriages were in fact "limited." The latter is the authors' preference. The question asked on the schedule was: "Was the family intentionally limited? If so, why? and how?" The authors comment as follows: "Logically this is exhaustive and should cover restricted intercourse. But it is to be remembered that on religious grounds many persons distinguish sharply between restriction of coitus and such interference *ab extra* as is involved in the use of pessaries or sheaths. It is also to be remembered that in current speech artificial limitation always means such interference (including here coitus interruptus). We also feel considerable doubt whether persons whose sexual appetites were almost absent or whose circumstances precluded them from intercourse would usually answer the scheduled question in the affirmative. Hence it seems to us probable that a large number of persons who were, from the physiological point of view, restricting their fertility, might bona fide enter 'no' in the schedule. We feel, therefore, very doubtful whether our statistical dichotomy of 'unlimited' and 'limited' marriages corresponds to a physical dichotomy." It seems impossible to decide between the suggested explanations, but the results published are of much interest.

The bulk of the paper was written some years ago, and the lamented death of Mrs. Frances Wood, which deprived statistical science of a brilliant student, together with the pressure of other duties upon the survivors of the collaboration, have precluded further extension of the analysis. In a summarizing note Dr. Greenwood observes that "The sociological implications of these results are left for the discussion of others. Here the personal impression is recorded that the analysis of the sample of middle class families has led to no result incompatible with the conclusions drawn by Professor Karl Pearson and his collaborators from wider data of a different kind. Whether these results, or any results of wider analysis, suggesting that neglect of eugenic principia is leading to a steady deterioration of the race, are likely to influence the

[1] *The Fall of the Birth Rate.* Cambridge University Press. 1920.
[2] The Fertility of the English Middle Classes. By J. W. Brown, Major Greenwood, M.R.C.P., the late Frances Wood, O.B.E., B.Sc., *Eugenics Review*, October, 1920.

reproductive habits of the educated classes or social legislation designed to modify those habits, is a question we need not attempt to answer."

THE THEORY OF VISION.

Dr. F. W. Edridge-Green, who is well known as an authority upon the subject of colour perception, has advanced a theory of vision which is opposed to the views of the large majority of physiologists. It has long been recognized that the rods and cones of the retina are the end-organs which have been differentiated to be acted upon by light and to give rise to impulses which, transmitted by the fibres of the optic nerve, ultimately reach the occipital cortex, where they are translated into visual perception. Each cone has a nerve fibre of its own, whereas one fibre serves several rods. This anatomical fact suggests that while both are important in the act of sight, the cones are of greater importance than the rods. It is generally believed that the cones are concerned in accurate form-vision which is the function of the macula alone. The share the rods take in vision is still a subject for research and discussion, but most physiologists have no doubt that they are true perceptive agents and are concerned in night vision. Gad and Nagel doubted whether they participated in the actual appreciation of light, and Edridge-Green has in several publications definitely stated that in his opinion the rods are not perceptive elements. Visual purple is abundantly found in the rods, but the cones contain none, and Edridge-Green's suggestion is that the rods are concerned in the supply of visual purple which is dispersed from the rods into the cones. The latter he imagines are the only end-organs which are sensitive to light.

This bold challenge of a generally accepted opinion has been taken up by Mr. J. Herbert Parsons in the *British Journal of Ophthalmology* for July, August, and September. He deals first with comparative anatomy, and points out that in most mammals, amphibia, and fishes there are both rods and cones, the former being most numerous. In most reptiles cones alone are found, and in birds they are present in large numbers. There are, however, certain vertebrates—rays, dog-fish, hedgehogs, bats, moles, and the night ape—which possess rods only, and owls, mice, and rats have only rudimentary cones. All these animals, including those with no cones, can see. Another point Mr. Parsons makes is that if the eye be dark-adapted, lights of low intensity appear colourless. As the intensity is increased colour is seen, first red, and then in succession colours of shorter wave-length. This photo-chromatic interval is practically absent at the fovea, the region of cones. It is greater in the peripheral than in the peri-foveal area of the retina. It is probable, therefore, that the cones are insensitive to light of low intensity, and are concerned among other things with colour vision, and that the rods are especially fitted for dark-adapted and achromatic vision. Again, with diminishing light and developing dark-adaptation, the brightness of the various colours alters. Colours at the red end of the spectrum become darker, those at the violet end brighter, so that eventually red appears black, and blue white. This phenomenon strongly supports the theory that two mechanisms are at work in light-adapted and dark-adapted vision, the former being carried out by the cones, the latter by the rods.

The theory that the rods are the agents of dark vision is supported by what is to be observed in night-blindness, a condition in which dark-adaptation is absent or very slow. In retinitis pigmentosa, which is characterized by severe night-blindness, the area of the retina affected by the disease is that where the rods are frequent and the cones few.

The evidence drawn from the evolution and anatomical structure of the retina is considered to militate against the theory that two elements so similar in form and in anatomical structure as the rods and cones should have such diverse functions as Dr. Edridge-Green would attribute to them. Even in the human retina intermediate forms are seen of such a nature that it is difficult to decide whether they are rods or cones, and in the fovea itself the cones are elongated and rod-like. Of the two the cones are the more complex in nature and the rods are absent in the most highly differentiated portion of the retina. The conclusion, therefore, would seem to be that the rods are the more primitive visual element, and that the cones became differentiated from them in the course of evolution. It is consistent with this view that the rods in man retain the primitive function of mere light perception, whereas the more highly differentiated cones have acquired the complex functions which are carried out in the macula. Moreover, as Sherrington has pointed out, the hypothesis that the rods have no part in the perception of light, but are merely concerned with the distribution of the visual purple, leaves unexplained their linkage to the retino-optic nerve paths; in fact it denies to one-third or more of the fibres of the optic nerve the conduction of visual impulses.

A GREAT GENERAL PRACTITIONER.

In his presidential address to the Section of the History of Medicine of the Royal Society of Medicine, delivered on October 20th, Dr. Charles Singer drew a charming picture of Francis Adams, perhaps best known to the general reader as the translator of Hippocrates, but whose commentary upon Paulus of Aegina was described by Haeser as *sehr werthvoll*—praise the Breslau scholar bestowed upon very few English medical-historical works. Few men have owed less than did Francis Adams to fortune, or have been, in the best sense of the term, more completely self-made. The son of poor parents, he received the elementary education open to the Scottish peasantry and won a bursary in the University of Aberdeen, where he graduated in Arts. The great superiority of the Scottish educational system did indeed confer upon him advantages which, had he been born 124 years ago in the same rank of society in England, he would not have enjoyed; but it appears that at the time he was a student in Aberdeen no instruction in Greek was provided, and that his subsequent mastery of that language was the fruit of self-tuition. Having graduated in Arts, Adams obtained the diploma of M.R.C.S. and settled down in Banchory as a general practitioner; in Banchory he remained until his death in 1861, and the scholarly labours which earned a European reputation were the recreation of a doctor who was always busied in professional work from breakfast to supper. The amount of work Adams got through was prodigious. When he was preparing his edition of Paulus he devoted ten hours a day to it, finding time by sleeping only four hours. He seems to have had the power attributed to the great Napoleon of commanding sleep, and the endurance of Frederic of Prussia, who also slept but four hours. The quality of Adams's researches was high, and he was also skilled in the lighter arts of classical scholarship which are generally only possessed by those who have served a very long apprenticeship. In later life he was offered the chair of Greek in his old university, but, far from complaining of the difficulties which medical practice put in his way, he loved his work as a doctor and

refused to leave it. Macaulay said of Gibbon, who believed that part of his success as a historian was due to service in the militia and the House of Commons: "We have not the smallest doubt that his campaign, though he never saw an enemy, and his parliamentary attendance, though he never made a speech, were of far more use to him than years of retirement and study would have been. If the time that he spent on parade and at mess in Hampshire, or on the Treasury Bench and at Brookes's during the storms which overthrew Lord North and Lord Shelbourne, had been passed in the Bodleian Library, he might have avoided some inaccuracies; he might have enriched his notes with a greater number of references; but he would never have produced so lively a picture of the court, the camp, and the senate-house." This judgement is applicable to the work of a medical historian, and it is of interest to remember that the only important contribution to the history of general medicine made by an English writer before the time of Adams was Freind's book, which can still be read with pleasure. Freind had also practised his profession. Although, as this year's Harveian orator observed, "our debt to classical antiquity is one that never can be measured," the prestige attaching to classical erudition has diminished; it is felt, and rightly felt, that other studies are as truly humane as those which received the appellation. Perhaps we have deciphered the most important of the ancient messages. If not, if there is still something to be learned from our remote predecessors, their interpreter is likely to be not a cloistered scholar, but one who, like Adams, was a scholarly practitioner.

AIR TRANSPORT.

THE possibilities of air transport, as a commercial undertaking comparable with rail and sea transport, are not as yet fully apprehended by the British public. The exploits of the fighting air services during the war are fresh in the minds of all, but we doubt if it is generally known how far the experience gained since 1914 has already been applied to commercial aviation. Air mails now fly every afternoon to Brussels and Amsterdam, and there is a daily passenger service between London and Paris. These regular services, and the commercial flight from Berlin to London on October 25th, foreshadow aërial connexions between this country and the principal cities of the Continent. On a recent visit to the Handley-Page aerodrome at Cricklewood we had an opportunity of seeing the present system at work. Precisely at 2.30 o'clock aeroplanes loaded with letters and packages began their rapid journeys, the one to Brussels and the other to Amsterdam; within two hours they had reached their destinations. A larger Handley-Page machine, of a type used two years ago in aërial warfare but now converted to civilian uses for the Continental service, was waiting to take us for a flight over London. This great aeroplane provides accommodation for ten passengers, two outside in front with the pilot and eight in the cabin. There is a gangway between the inside seats, which are so arranged that each traveller has a good view of the world below. There is a small lavatory with an automatically closing bucket-seat, and beyond there is a freight-hold for the air mails and for general cargo. On a Continental trip each passenger may carry thirty pounds of luggage for the price of his ticket. Two Rolls-Royce engines, each of 350 horse-power, provide the motive force, and an average speed of eighty miles an hour can be maintained. The machine rose imperceptibly into the calm air, and throughout the flight there was little sensation of movement, though the roar of the engines and propellers became a burden. The passenger's power of estimating height or speed was lost almost at once. To one who had never seen London from above the experience was of absorbing interest. The great city was bathed in the sunshine of a fine October afternoon; its beauty far surpassed anything that might have been imagined from a study of aeroplane photographs. No prospect from any terrestrial height gives an idea of the majestic panorama of London seen from an altitude of several thousand feet on a clear day—"all bright and glittering in the smokeless air." It was curious, on returning to earth after this experience, to pass through the aerodrome buildings and observe the *douane* neatly laid out in readiness for the passengers by air from Paris, the customs house official standing chalk in hand beside the luggage counters. The impression was one of orderly, businesslike routine, and of pilots working to a scheduled time-table with clockwork regularity. No one having seen this could believe that civil aviation is in danger, as it is said to be, of death from neglect during early childhood.

THE COMING DENTAL BILL.

THE promised Dental Bill which the Government has in preparation will greatly amend, or perhaps supersede, the existing Dentists Act. It has not yet been made public but is to be expected shortly. It is an open secret that it will follow pretty closely the recommendations of the Departmental Committee which reported about eighteen months ago. In anticipation of the appearance of the bill, which will be a Government measure, the British Dental Association has circulated a memorandum which, while summarizing the conclusions contained in the report, sets out certain alterations in the Departmental Committee's recommendations which the executive of the association desires. The memorandum is temperate in expression, and, for the most part, the alterations desired are not very drastic; its suggestions call for careful consideration. The outstanding feature of the bill will be complete prohibition of unregistered practice, and this will be an inestimable boon. But inseparable from such prohibition is the admission to the *Register* of a number of persons who, without breaking the letter of the law, have for some time carried on dental practice without qualification; to this the association "reluctantly" agrees, since there is no other way to a much needed reform. In so far as the association's suggestions go towards rendering this prohibition efficient, they may be sure of a sympathetic hearing, for it is the intention of the proposers of the bill to shut the door against evasion. Beyond this, a word of warning may not be out of place, for the smallest acquaintance with parliamentary procedure emphasizes the danger of anything approaching to opposition: an unopposed bill will go through quickly, whereas it is very easy to wreck a bill by numerous amendments; hence, where the main objects of a bill are agreed to be eminently desirable it should be recognized that unless the Government are willing to accept alterations, and agree to them, there is much risk in pressing them. It is not necessary at present to discuss all the points raised seriatim, but it may be pointed out that where the British Dental Association differs from the recommendations of the report, the report gives reasons for its conclusions, as does also the memorandum. In some cases the balance of argument seems to us to be on the side of the report, as is the case, for example, as to the question whether the persons admitted on the ground of having been in practice for a substantial number of years should be placed on the old *Register* or whether they should be in a separate list. On the other hand, we think that the association is right in taking exception to the provision that, where there is no medical man nor registered dentist accessible, a person extracting a tooth for the relief of pain may be entitled to make a charge not exceeding one shilling. This might result in the creation of a class of tooth extractors with no sort of qualification, yet recognized to a certain extent under the Act. Accessibility of registered persons is a vague term, and difficult of proof, but perhaps this provision may not appear in the bill. It should be remembered that the Departmental Committee contained representatives of various points of

view, and that half of its members were laymen, some of whom, however, had previous knowledge of medical education, so that the unanimity of the Committee may be expected to carry much weight. If we may venture to offer a word of advice to the British Dental Association, it would be to try to get the Minister in charge of the bill to agree to insert amendments to meet the wishes of the association, but to be very chary of endeavouring to force anything upon him in Parliament, lest the essential boon of prohibition—a very real and great step in advance of previous medical legislation—be lost.

INCREASE OF WORLD POPULATION.

It is a little over a century since Malthus formulated his theory of the conditions governing the increase or decrease of populations. Looking at the matter in a broad way he found no difficulty in maintaining that increase or decrease was determined by the ease or difficulty with which food was obtainable. This influence might operate by deterring persons from marrying or from marrying young, but he expected the adjustments to be made by catastrophes—war, pestilence, and famine; he paid less attention to the slower effects of continuous shortage of food. As a prophet he was before his time, for the world's food supplies have been increased through the opening up of new countries and have been more equably distributed owing to improvements in the means of transport. Experience during the war not only called attention to the dependence of the industrial nations on the importation of food, but also showed that the world's margin was dangerously small. Professor E. M. East, of Harvard, in his valedictory address to the American Society of Naturalists, of which we find an abstract in a recent issue of *Nature*, attempted a forecast of the results of the greater pressure of population in the not very distant future. He estimated the present population of the world at about 1,700 million people, and the annual increase at about 14 to 16 millions; most of this increase is in the white race, which is increasing much more rapidly than the yellow or black. Professor East accepted the view that China's population of 300 millions is practically stationary; that country, it may be observed, suffers periodically from famines, and from catastrophes such as the flooding of its rivers, but it would seem that the main reason why the population does not increase is that the soil is incapable of carrying a larger number of persons; domestic animals have almost disappeared and infanticide is practised. Professor East admits that the birth-rate in most civilized countries is steadily decreasing, but preventive medicine has lowered the death-rate in most such countries, and its progress may be expected to lower it still further; the net result is that most white nations are still increasing. Professor East therefore thinks that the decline in the birth-rate will have no great effect on the natural increase in the population of the world for many years to come. He estimates that if the rate of increase which existed in the United States during the nineteenth century should continue, the population within the span of life of the grandchildren of persons now living would number more than a billion. "Long before this eventuality the struggle for existence in those portions of the world at present more densely populated will be something beyond the imagination of those of us who have lived in a time of plenty." In America, thought to possess inexhaustible riches, returns are diminishing. The United States have a special problem, for the birth rate of the foreign population now coming largely from Eastern and Southern Europe is so much greater than the birth rate of the Anglo-Saxon stock that within a century the latter will be only a small fraction of the whole. Professor East expressed the belief that the United States will severely restrict immigration. He considered in detail what could be done by improved utilization of energy, improved agriculture, improved breeding, and so on; but he is not sanguine, and has no belief in a solution being found through better utilization of food from the sea. Professor East offers no general remedy, but looks to the spread of education, equitable readjustment of many economic customs, rational marriage selection which will tend to an increase of the birth rate in families of high civic value, and among the rank and file a restriction of births commensurate with the family resources and the mother's strength. He does not tell us how this last is to be achieved.

"UNPOPULAR CAUSES."

SIR GEORGE KEKEWICH has lately published *The Education Department and After*. He dedicates the book to the National Union of Teachers. It is certain that he enjoyed the loyalty and the gratitude of the members of this great National Union: and they were good judges of his work. But it seems that he did not always work well in harmony with the authorities of the Board of Education, and his book is rather heavily weighted with egoism and with invective. But these do not concern the medical profession. Nor is it our business to study the ins and outs of the past history of the Education Department and the Board of Education. Our only concern is with ten pages, near the end of the book, headed "Unpopular Causes"—five pages on "Antivivisection" and five on "Vaccination." (This, of course, is a slip for "Antivaccination.") We need not stay long over the five pages on vaccination, for they are altogether cheap and worthless. He says not one word about Gloucester and Dewsbury; not one about glycerinated lymph; not one about vaccination of contacts in Leicester. "I am not desirous here of entering upon the vexed controversy whether vaccination is or is not a preventive of small-pox." Was there ever such a foolish sentence! And again, "Public vaccinators are, as a body, by no means rich, and their belief is not likely to be modified by the fact that compulsory vaccination is a very valuable material asset to them." Unhappy man that he is, his pen runs away with him, and writes the most amazing remarks. In the five pages on antivivisection, we find one good sentence: "Probably the most unpopular cause I ever handled was that of antivivisection." We are glad to hear from him that it is so unpopular as all that. Few men in public life have done more than Sir George Kekewich to make it unpopular. It was he who quickened in it, at a meeting in London, the spirit of class hatred: he said, "Our hope is no longer in the idle rich; we must touch the heart of the democracy." His evidence before the Royal Commission, on December 18th, 1907, was pitiable. "We have no absolute proof that anaesthetics are ever used, because no antivivisection doctor has ever been allowed to witness any experiment." Again, he was asked whether his antivivisection society or he had accepted Professor Starling's long-standing invitation to them to come to a laboratory and see things for themselves. They had not. "What I should like to do would be to be able to see through a hole in the door without it being known that I was there." Thus he chattered to the Royal Commission, and in 1920 he is just as unwise as he was in 1907. Happily the members of the National Union of Teachers will not be gravely impressed by these ten pages: and there still remain three hundred and forty-eight pages from which they can learn his opinions on other subjects.

SIR GEORGE NEWMAN'S first annual report as Chief Medical Officer of the Ministry of Health has just been published.[1] Part I consists of the Chief Medical Officer's general statement. Part II deals, in order, with the work of the six sections into which the Medical Department of the Ministry is divided, each report being signed by the

[1] Cmd. 978. H.M. Stationery Office. 3s. 6d. net.

senior medical officer of the section. The third part contains ten appendices on a variety of topics, including a summary of the Ministry of Health Act, 1919. The whole volume contains nearly 400 pages; some of its principal features will be discussed in a future issue.

A meeting of the Victor Horsley Memorial Committee will be held at the house of the Royal Society of Medicine, 1, Wimpole Street, W.1, on Wednesday next, November 3rd, at 5 p.m.

We regret to announce the death, in his 86th year, of Dr. William Bruce of Dingwall, who was for twenty years the direct representative for Scotland on the General Medical Council.

Medical Notes in Parliament.

Proprietary Medicines Bill.

This measure, which was introduced in the House of Lords, and passed through all its stages except report before the summer adjournment, is to be taken on report in the course of a week or two. This will be done in all probability so soon as Lord Astor, who is in charge of the measure, returns to London. Several amendments promised by the Government have to be submitted, and notices have been given of several amendments to be moved by private members.

The Hospital Question.

Dr. Addison's Address to the House of Commons Medical Committee.

On the invitation of the medical and university members of the House of Commons, Dr. Addison, on October 26th, addressed a gathering of members of Parliament in one of the Committee rooms to explain the Hospital Clause in the Ministry of Health (Miscellaneous Provisions) Bill. Dr. Nathan Raw presided.

Dr. Addison expressed his pleasure at the opportunity afforded him, especially as there appeared to be much misapprehension amongst the public as to the nature of the proposal contained in Clause 11 of the bill, and also as to the projects which it had in view. It had been suggested in the press that the Ministry contemplated putting voluntary hospitals on the rates, and as the bill could not be brought before the House of Commons for second reading for some little time, he was desirous to correct misunderstandings of that kind.

Voluntary Hospital Finance.

In the early part of this year he appointed a number of gentlemen to examine the financial position of voluntary hospitals, and conferred with representatives of these hospitals. He found that for the five years up to 1918 the expenditure of the voluntary hospitals outside London exceeded the income by £1,311,000, and that the expenditure of the London hospitals was £893,000 in excess of their income for the same period. As for the legacies, some of them were ear-marked for investment; but it was found that during those five years, in the case of the provincial hospitals, the legacies which could be used for current expenditure amounted to £1,078,000. In the case of the London hospitals the legacies amounted to £1,083,000.

In 1919 the expenditure rose more rapidly than the income. If they took in the legacies with the ordinary income they would find that in the five years up to 1918 they would practically balance if evenly distributed. But in 1919 the expenditure was going rapidly ahead of the income. The vast bulk of the extra expenditure was due to increase in wages and salaries and the cost of materials. Unfortunately, too, the legacies not being equally distributed, a number of hospitals were on their beam ends. In 1920 the cost was rising still higher and the income diminishing. Thanks to the campaign which the Red Cross Society inaugurated, the income had now somewhat improved, but the condition of various hospitals became some months ago very critical. As a result of various negotiations the King Edward Hospital Fund allocated £250,000 towards meeting the needs of London hospitals, and the National Relief Fund had agreed to set aside £700,000 to assist in meeting the deficiency of voluntary hospitals, feeling justified in doing this because the position had arisen through war circumstances. A Special Committee appointed to determine the grants had held its first meeting for making grants that morning, at the Ministry of Health. Dr. Addison claimed that the efforts he had made to save the voluntary hospitals were a complete answer to the charge that his department was engaged in sinister conspiracy to put the hospitals on the rates.

Hospital Accommodation.

Dr. Addison then turned to another side of the question to justify the Government proposals. The voluntary hospitals did not provide half the hospital beds in the country, nor anything like a half. The number of hospital beds in the voluntary hospitals, general and special, was little over 45,000. Apart from these, the fever and small-pox hospitals of one kind and another provided 49,000 beds, and the beds in Poor Law infirmaries numbered 94,000. Thus, the number of beds provided by bodies other than voluntary institutions reached to 143,000. The country owed an unspeakable debt to the people who spent their lives in promoting the well-being of the voluntary hospitals. It was most desirable to keep the initiative, variety, and enterprise which attached to well-managed voluntary hospitals, and of course the administration brought in a great body of experience peculiar to such hospitals which it would be a catastrophe to lose. Therefore no Minister of Health in his senses would set about to destroy voluntary hospitals, apart from the fact that if he did so the country would have to bear the burden of several millions of additional expenditure. It had to be recognized, however, that the voluntary hospitals were not evenly distributed and that a large number were in financial difficulties. What made the matter worse was that the "new rich" had not yet learned to subscribe, and old subscribers could not do so as formerly because they found their taxation so very heavy.

In these circumstances he started, during the present year, an inquiry into the position of the Poor Law infirmaries. Experts examined 53 of these institutions, and the report was most encouraging. In a number there was much spare accommodation. In one at Camberwell, for instance, there were 200 empty beds, and at Withington near Manchester, out of a provision for 2,600 persons there were 1,100 empty beds. Further, he had a scientific examination made of the best of these Poor Law infirmaries, and the report of most of these places was most favourable.

The proposals which he was making were designed to secure the use of these empty beds. It was necessary to try to make the best use of all the accommodation available. A considerable number of guardians were receiving paying patients. He did not know whether it was an infraction of the Poor Law. It was being done, and he would be betraying his trust if he were to prevent its being done in face of the enormous shortage. Section 131 of the Public Health Act enabled public authorities to provide hospitals, and the question had arisen whether that meant non-infectious hospitals, or general hospitals. A considerable number of authorities had taken it that the powers under the Act were general powers. He could mention an authority within hail of Westminster which had made a Poor Law infirmary into a general hospital. Another classic case was that of Bradford. They had converted a Poor Law infirmary into a general hospital to help them meet the needs of the city. In proof that he was not going against the opinion of medical men in what he was doing Dr. Addison said that he obtained the views of the Bradford Division of the British Medical Association, and they agreed with the principles of the proposal as regards Bradford, with some modifications. The Ministry had the alternative of doing nothing but mark time and so allowing institutions to become bankrupt, in which case there would have been a great outcry at the burden put on the ratepayers; or else of allowing what was happening to take place. Under Section 131 of the Public Health Act, as he was advised, the only authority which had not power to deal with this kind of thing was the county council, and clearly, if these infirmaries were to be used, the county council should have authority to take them in hand. The object of the clause was to enable this to be done and to clear up the interpretation of the law.

Dr. Addison went on to say that he wished to secure the help of the medical profession, and looked forward to having it. But, of course, if an authority found the money for a particular service, it naturally would have a determining voice in how the money should be spent. He desired, however, that, before a scheme was definitely determined upon, they should be guided by the medical profession.

The Insurance Medical Service.

The Minister next addressed the Committee on another subject, that of the Insurance Medical Service. Statements had appeared to the effect that he had arranged that each medical man should have 3,000 patients on his panel. That was a complete misunderstanding. Before the new Regulation was made there was no limit to the number of persons who might be put on the panel of a single medical man. The Advisory Council therefore said it was desirable to have a limit, and the local authorities could if they liked fix a lower limit. As a matter of fact, out of 12,000 medical men on the Insurance List, only 254 had as many as 3,000 persons on their list, and 7,204 had less than 900.

In the course of the discussion which followed, Dr. Addison mentioned that he had received from Captain Elliot a list of local authorities who were making contributions for hospitals. Colonel Fremantle asked Dr. Addison if he could guarantee that, if the proposal were proceeded with, there would be no abatement of the Government's desire to deal with the whole question of the medical service. Dr. Addison replied that this was only a tiny fragment of what was contemplated, and he readily gave the assurance asked for.

Captain Elliot said the Committee did not wish to express any opinion on what the Minister had kindly stated to them, but the address showed the urgent necessity for a full debate in the House on the whole position of the health services. Mr. T. Myers asked whether, if the voluntary hospitals had adequate financial support, they would be equal to the needs of the community. Dr. Addison replied that, of course, they would not. Mr. Myers said that was the answer he had expected. People had a very definite objection to going into Poor Law institutions, and it would be a generation before that feeling had passed, whatever scheme was adopted. Some time ago a report had been issued in favour of the breaking up of these institutions and the transference of the functions of the guardians to other authorities. It was highly desirable that that should be proceeded with. The time had passed for voluntary institutions, maintained by going round with the hat. It was a public responsibility, and the Government should take the matter up on the lines suggested. Captain Elliot hoped the Labour Party representatives would not rashly decide in favour of a policy which would sweep away voluntary institutions, which were doing so great a work. That would entail a further increase in the rates, and the doctors, who had to pay so heavily, would not be able to give their services. Dr. Addison added that Sir George Newman (who was present) informed him that the number of empty beds in Poor Law infirmaries was about one-third of the accommodation.

The Dentists Bill.—About a hundred members of Parliament attended a meeting called by Mr. Raffan, on October 26th, to urge the Government to bring forward the proposed legislation as to the registration of dentists, on the lines of the report of the Select Committee over which Mr. Raffan presided some months ago. The proposal is that in establing the registration system dentists who have not qualified by examination shall be allowed to continue in practice if they have been in practice for five years, and that those who have begun in the last five years shall be able to do so on passing an examination. It was agreed to ask the Government to introduce the bill this session, and, if it proved uncontentious, to pass it within the session.

Pensions Appeal Tribunal.—A number of questions have been addressed to the Minister of Pensions with reference to the work of the Pensions Board and the Pensions Appeal Tribunal. Mr. Spencer inquired what relief there was for a disabled man who had on enlistment passed as A1, but was debarred from benefit on the opinion, first of a doctor and then of a medical board, that he was suffering from some ailment contracted before he entered the service. Mr. Macpherson replied that recourse could be had to the Medical Appeal Board, that would sit with the other additional board under the jurisdiction of the Lord Chancellor. He added, in reply to Mr. Newbould, that in 70 per cent. of the cases the Lord Chancellor's tribunal decided in favour of the appellants. In reply to Sir Henry Cowan, Mr. Macpherson said that if a man was discharged from the army or navy by reason of an ailment resulting from his service, that clearly would be a case within the jurisdiction of the Ministry of Pensions. Referring to a particular case that Sir Henry Cowan had brought before him, Mr. Macpherson said there was an appeal first of all to a medical board, and that had turned it down; then there was an appeal to an Appeal Tribunal, which also turned it down. In such circumstances, what could a Minister do except be guided by his technical advisers?

Ex-service Men receiving Poor Law Relief.—In answer to several questions, on October 21st, touching the application by discharged soldiers and sailors for Poor Law relief, Mr. Macpherson said that discharged disabled men who held that their assessment for pension did not adequately represent the extent of their disablement were, under present arrangements, entitled to appeal and have their cases reviewed by a Medical Appeal Board and by the Ministry of Pensions. Mr. Lawson put it that medical boards were turning away without pensions many men who were suffering as the result of their war services, and he wanted to know whether any order had gone out to the medical boards on this subject with a view to turning men away. Mr. Macpherson maintained that the Ministry of Pensions had been legitimately generous in all cases in which disabled men had been assessed, and again referred to the resource provided in the Supreme Court of Appeal appointed by the Lord Chancellor.

Suicide Statistics.—Replying to Mr. Malone, on October 21st, who sought statistics regarding suicides of ex-service men since the termination of the war, Dr. Addison said the number of persons who had committed suicide in Great Britain during the period from the last quarter of 1918 to the first quarter of 1920, both inclusive, was 5,219. No figures were available as to what number or percentage of those persons were ex-service men.

Cost of Living.—The average increase in the comparative cost of living of the working classes since July, 1914, was 155 per cent. on July 31st, 161 per cent. on September 1st, and 164 per cent. on October 1st. Sir Montague Barlow stated that the increase during the months of August and September was largely due to seasonal increases in the price of milk, butter, and eggs, and to the increase of rents resulting from the recent Increase of Rent and Mortgage Interest (Restriction) Act.

SOCIETY OF MEDICAL OFFICERS OF HEALTH.

Presidential Address.

AT the annual meeting of the Society of Medical Officers of Health, held on October 22nd, the new President, Lieut.-Colonel F. E. FREMANTLE, M.P., consulting medical officer of health for Herts, gave his presidential address on Parliament and Public Health. He referred to the share medical officers of health individually and as a body could take in the government of this country, with a view to the promotion of national health. No one, he said, who had been through the experience of a medical officer of health could fail to realize the unique opportunities that offered themselves in Parliament. In order to be of value in political life it was of great importance that a man should have a ground-work not merely of the functions and statistics, but of the habit of mind of a medical officer of health, who, in his professional work, had to go through the processes of reconnoitring the ground, as every public man should do. The President next considered the new outlook for preventive medicine and health work in the light of the experiences of the war and the discoveries of this century. The influence of medical officers of health on public opinion, he said, was indirect, subtle and hidden, but very great. He then discussed what the Government had done for public health in the past, what it might achieve in the future, and how, through Parliament, it could be helped to do this. Those who had served with the Army Medical Service in the war felt that the function of the Ministry of Health must be comparable with that of the A.M.S., which was responsible for the health and physical efficiency of all the troops. Coming to the health measures now before Parliament, Colonel Fremantle held that it was a mistake to suppose that the clause in the Ministry of Health (Miscellaneous Provisions) Bill allowing county councils to subscribe to voluntary hospitals, or to maintain hospitals of their own, was intended as a substitute for general action on the problems raised by the Consultative Council. He regarded it as merely a stop-gap proposal to continue the provision of medical aid until the problem could be dealt with as a whole. In conclusion, he referred to the value of co-operation with kindred bodies, remarking that the parliamentary work of the British Medical Association deserved the fullest recognition from the Society of Medical Officers of Health.

Annual Dinner.

The annual dinner of the Society was held at the Hotel Cecil, on the evening of the same day, with the PRESIDENT in the chair. Among those present, in addition to the speakers, were Sir George Newman, Major-General Sir William Macpherson, Air Commodore M. H. G. Fell, and Dr. W. H. Hamer, medical officer of health to the London County Council. The toast of "The Fighting Services" was proposed by Professor H. R. KENWOOD, who eulogized the splendid and successful efforts made during the war to overcome our enemies, microscopic and macroscopic. In responding, Brigadier-General W. W. O. BEVERIDGE, Director of Hygiene at the War Office, spoke of the great advances made in army hygiene. One of the most serious problems of the war was the loss of man power from disease caused by dirt and vermin, which accounted for 50 per cent. of the admissions to hospitals. The lessons then learnt had, however, borne fruit: the Royal Navy had its own sanitary service, with health officers in every port; the Royal Air Force, too, had its separate sanitary service. In the Regular Army a Directorate of Hygiene had been set up, and a corresponding directorate would form part of G.H.Q. when the army again took the field. Further, in every command there were now schools of hygiene for the instruction of all ranks in the preservation of health, and sanction had been given for the formation of four sanitary companies, each consisting of four sections, in the Territorial Army. The toast of "Parliament and the Public Health" was proposed by Professor E. W. HOPE, who spoke of the need for education in public health, and suggested that Parliament should exercise liberality in this and cognate matters. Sir PHILIP MAGNUS, M.P., in his reply, said that medical science had come under discussion more often during the last two or three years in Parliament than for many years previously; this was largely due to the active part taken by the medical members of Parliament. He referred to his personal debt to the medical profession and to the kindness shown by medical men towards all that he had tried to do on their behalf in the House of Commons. The BISHOP OF ST. ALBANS proposed "Prosperity to the Society of Medical Officers of Health," and took the opportunity to urge the need for co-operation between

the doctor and the clergyman before the patient was past hope of recovery. The President, in his response gave an outline of the society's work in recent times, and congratulated his predecessor, Professor Kenwood, and the executive secretary, Mr. G. S. Elliston, on the success of their administration. The health of "The Visitors" was proposed by Dr. T. Eustace Hill, and was replied to by Sir Arthur Robinson, first secretary of the Ministry of Health, Sir Anthony Bowlby, President of the Royal College of Surgeons of England, Mr. J. W. Gilbert, Chairman of the London County Council, Lord Dawson of Penn, and Dr. T. W. H. Garstang, Chairman of Representative Meetings of the British Medical Association.

School Medical Group.

The School Medical Group of the Society of Medical Officers of Health held its fourth annual meeting at the society's offices on October 23rd, with Dr. G. F. Buchan in the chair. School and assistant school medical officers attended from the North, the Midlands, and the South of England, representing the London County, counties, county boroughs, and municipal boroughs. Official recognition and representation on the council of the society having been obtained by the reconstitution of the society, new rules and constitution for the group were considered and adopted unanimously.

The objects of the reconstituted group are:

(*a*) To promote and saf guard the interests of all medical practitioners engaged in connexion with the medical inspection and treatment of diseases and defects affecting children of school age and to secure closer co-operation with other departments of preventive medicine.

(*b*) To arrange meetings in London and provinces for reading and discussion of papers on clinical, pathological, and administrative problems in connexion with the diseases and defects of children, including clinics, special schools, domiciliary and institutional treatment, and educational schemes.

A representative Group Council was elected. It will arrange meetings and organize provincial subgroups having similar objects, for any area, on the application of twenty-five members of the group. Dr. George A. Auden (Birmingham) was elected president and representative on the council, and Dr. A. Ashkenny (Town Hall, West Bromwich) was re-elected honorary secretary, with whom those interested in the welfare of school children and the school medical service are invited to communicate.

Ireland.

MEETING OF MEDICAL DELEGATES.

Report of Public Health Council.

A meeting of medical delegates representative of the entire Irish medical profession was held in the Royal College of Surgeons, Dublin, on October 20th, when Mr. R. J. Johnstone, F.R.C.S., was in the chair. Notwithstanding the great difficulties in travelling at present in Ireland, the meeting was the largest and most representative held for many years. Delegates were present from such remote counties as Donegal and Kerry. The principal item on the agenda paper was the report of the Irish Public Health Council, which gave rise to a long and interesting discussion. There is a very strong feeling amongst all classes of people in Ireland that their country has been very badly treated in the matter of medical legislation.

Historical Note.

One of the resolutions passed at the meeting points out that while Irish taxpayers contribute their full quota towards the Treasury grants for health services in Great Britain, Ireland does not receive its fair share from the common purse. This state of affairs is mainly due to the fact that Parliament has always availed itself of some pretext to shirk Irish medical legislation with the result that Ireland is fully half a century behind the countries of Western Europe as regards its health services. The Irish press is insistent that if Ireland is to receive its proper share for health services it should be paid about another million sterling per annum from the public funds. It must be admitted the Irish medical profession has ample reason to be dissatisfied with the treatment it has received from Parliament. There are few to question that the Irish Poor Law medical officers, who constitute the chief public medical service in Ireland, and who, in numbers, are more than 50 per cent. of the Irish medical profession, are the worst paid in almost any country. Until recently they derived their salaries in equal proportions from the local rates and Treasury grants. In 1900 the inadequacy of the salaries became a very burning question, and in their efforts to improve their position the Poor Law medical officers received the active support of the British and Irish Medical Associations. The British Medical Journal devoted, at the time, much of its space to the grievances of the Irish Poor Law medical officers, and extracts from it were regularly quoted in the Irish daily and local weekly press. In the majority of dispensary districts Poor Law medical officers are still liable to render gratuitous medical relief to 60 per cent. of the population of their extensive districts. That so many of the population were and are entitled to free treatment under the Medical Charities Act is due to the fact that these Acts provided for the famine conditions that existed in Ireland in 1847 and 1848, when as many as 70 per cent. of the population were not only destitute, but in a starving or semi-starving condition. Irish medical legislation is so antiquated that the Medical Charities Acts are practically the same to-day as they were in 1847, when they completely failed to provide for the needs of that time. It is only just to say, however, that as far back as twenty years ago the majority of boards of guardians in Ireland realized that their medical officers were in receipt of salaries in many cases not equal to the working expenses of their extensive districts and voted increased remuneration, half of which fell on the local rates and the other half on grants from the Treasury, which was a statutory provision. The Local Government Board, however, rarely sanctioned the full amount of these increases, though they seldom exceeded £15 or £20 a year. This action of the Local Government Board was generally attributed to the refusal of the Treasury to provide its moiety of the increases.

Present Position.

In 1902 the position of the Treasury was made quite clear, as the Government passed an Act relieving the Treasury, amongst other matters, of its obligation to contribute any portion of the increases in the salaries of Irish Poor Law medical officers. In recent years the Treasury, as the result of the 1902 Act, does not pay one-fifth of the salary of an Irish Poor Law medical officer. This, in particular, is the case where doctors' salaries have been recently substantially increased by boards of guardians. The passing this year of the Malicious Injuries (Ireland) Amendment Act and the Restoration of Order in Ireland Act provides that the treasurers of the Irish local authorities shall out of the first moneys under their control meet decrees under the amending Malicious Injuries Act. The effect of this legislation will be as in Limerick Union; when the doctors recently presented their cheques for payment, the treasurers informed them that there was no money to the credit of the guardians.

In connexion with the report of the Irish Public Health Council the following resolutions were unanimously passed by the meeting of delegates:

1. That this meeting of medical delegates approve generally of the Report of the Irish Public Health Council, including the outlines of an Irish Medical Service, which, with the modifications suggested in the report to meet local conditions, should meet all the requirements of an efficient health scheme for the Irish people. A rider was adopted that, in industrial areas, such as Belfast, medical benefits, as in England, should be applied.
2. That, while this meeting approves the fundamental principles of the financial suggestions of the report—namely, that in all expenditure on health services the State and local authorities should share responsibility equally, we are not satisfied that the report contemplates an adequate expenditure on the medical services, and we desire to emphasize the fact that without adequate remuneration of medical officers the desired result of an efficient medical service cannot be attained. That when the proposed Ministry of Health comes to formulate its scheme for an Irish Medical Service, in consultation with representatives of the medical profession, as is suggested in the report, these representatives be directed to press this point on the Ministry.
3. That this meeting desires to point out that, while Irish taxpayers contribute their full quota towards Treasury grants for health services in Great Britain, Ireland at present draws much less than its fair share from the common purse.

Dr. Hickey, in proposing the resolutions, said that it was quite clear that the chief concern of the Irish Public Health Council was to formulate a scheme for a Ministry of Health for Ireland which would suit this country in

every respect, and he was of opinion that the Council had very well achieved that object. Though the Irish Public Health Council in the report kept the health interests of the people all the time to the front it was not forgotten that for that purpose it would be necessary to secure the hearty co-operation of the Irish medical profession. Without such co-operation no medical reform could bring any advantages to the people. The financial arrangements of the report were, he said, somewhat disappointing, and, though an improvement on existing remuneration, fell short of the legitimate expectations of the doctors.

Dr. Murphy, in seconding, endorsed what Dr. Hickey had said. Medical representatives of the Irish Public Health Council had done very excellent work, and though naturally as members of the medical profession they felt bound to formulate a scheme for a Ministry of Health for Ireland to give first place to the interests of the people, he was fully convinced they did their best in every way for their profession, who should be under a deep debt of gratitude to them.

A warm vote of thanks to Dr. Rowlette and the other medical representatives on the Public Health Council was carried with acclamation.

Withholding of Public Health Grants.

Regarding the action of the Government in withholding the grants for the public health services the following resolution was unanimously passed:

> That this meeting of delegates strongly protests against the diversion of the existing grants to the Irish Public Health services (including portion of the salaries of Poor Law and other medical officials) to any other purpose as inflicting great hardship on the helpless sick poor, as well as depriving those responsible for their medical treatment of the necessary means to render them efficient professional services.

Medical Attendance on Royal Irish Constabulary.

The terms accepted by the Irish Medical Association for medical attendance on the Royal Irish Constabulary were approved. The new remuneration is £1 4s. per annum for each police constable, without attendance, as heretofore, on the dependants. The capitation fee covers cost of medicine and surgical appliances. In addition to the capitation fee there is a mileage allowance of 6s. per annum for all constables residing over two miles from the doctor's residence.

Regarding the terms of appointment of medical attendants to the police, and arising out of representations made by the Irish Committee of the British Medical Association to the Inspector-General of the Royal Irish Constabulary, the following resolutions were unanimously adopted:

> That any settlement of the question of medical attendance on the constabulary should provide in the case of the dismissal of a medical attendant that the reasons for such removal be fully stated and, if demanded, an open inquiry should be granted.
>
> That in any case where a doctor recently resigned his office as medical attendant on the police, owing to the unsatisfactory conditions of the service, and if the position is now held by another doctor he should resign if the former medical attendant is willing to resume his office.
>
> That this resolution should also apply, in similar circumstances, to the medical attendants on postmen, coastguards, railway employees and others, as well as in the case of registrars of births, deaths, and marriages.

Amalgamation of Irish Medical Organizations.

The Chairman, Mr. R. J. Johnstone, who is also chairman of the Joint Organization Committee appointed in July, 1919, to consider the question of uniting the Irish medical profession in one representative organization, gave an account of the work done by the Organization Committee (in accordance with its terms of reference), including the interview which took place on November 5th, 1919, between the Council of the British Medical Association and the deputation appointed by the Joint Organization Committee. The Chairman, however, was of opinion that, owing to the present very unsettled condition of Irish affairs, much further advance could not be made until the political situation became more settled; he suggested that the Joint Organization Committee be reappointed, and that it should meet and report when it considered the time was suitable to resume negotiations for the amalgamation of existing Irish medical bodies. The suggestion of the Chairman was unanimously adopted by the delegates.

Fees for Medical Examination for Life Insurance.

The question of fees for medical examination in the case of life insurance gave rise to a somewhat warm discussion, and the action of city consultants who accept the medical examination of cases refused by provincial practitioners, owing to the inadequacy of the fee, was adversely criticized. The "lock-out threat" conveyed to the meeting on behalf of the insurance companies was warmly resented as being uncalled-for and high-handed. The position of the insurance companies is that they will not pay a scale of fees in Ireland higher than in England, and that the English scale was accepted by the British Medical Association. To that the Irish doctors reply that the increased fees given to English doctors by the intermediate offices in industrial insurance cases is undoubtedly substantial for the class of medical examination required. These increased fees, however, do not apply in the case of nine out of every ten doctors in Ireland, where the number of industrial insurances are negligible from the point of view of the average medical practitioner.

It was explained to the delegates that the British Medical Association neither accepted nor recommended the scale of fees as applicable or suitable to conditions in Ireland. The Irish Committee of the British Medical Association, at its meeting on October 20th, strongly condemned the unjustifiable use the insurance companies were making in Ireland of the Association's acceptance of fees meant to be applicable to Great Britain.

The delegates decided to adopt the scale of fees agreed upon at a recent meeting of the medical practitioners in Dublin—namely, £1 1s. for medical examination and report for proposals under £500, and £2 2s. for proposals of £500 and upwards. A deputation was appointed to confer with the insurance companies, and it was decided that if an amicable arrangement was not come to between the insurance companies and the doctors, steps should be taken for a thorough organization of the profession to secure their demands.

Irish National Health Insurance Commission.

The delegates agreed to appoint, as suggested by the Irish Insurance Commission, subcommittees of each Local Medical Committee to investigate complaints in regard to medical certification under the Insurance Act, the medical treatment of ex-service men, and any other business which Local Medical Committees, for their convenience, might assign to the subcommittees.

Other Business.

The question of the payment of the salaries of Poor Law medical officers is receiving special consideration, but so far the proceedings are of a confidential character, as it is considered it would not be helpful to have such matters at the present time the subject of public discussion.

The delegates considered several other matters on the agenda paper, many of which had been discussed at previous meetings.

A very cordial vote of thanks was passed to the chairman, Mr. R. J. Johnstone.

England and Wales.

Liverpool Medical Institution.

The first meeting of the eighty-second session of the Liverpool Medical Institution was held on October 14th, 1920. There was a large attendance of members and associates, and war medals and decorations were worn. The president, Dr. John E. Gemmell, delivered an inaugural address on literature and medicine. Rapidly passing in review the intimate connexion between letters and the healing art, he remarked incidentally how much more famed in literature than for their contributions to medical knowledge were the majority of those whose names he brought before his hearers. An exception was the case of Dr. Oliver Wendell Holmes, who contributed observations of great value to the elucidation of the cause of puerperal fever. The cultivation of literature was a real recreative influence, freeing the mind from the trials of practice at the close of a day's work. A vote of thanks to the president for his address, proposed by Dr. T. R. Glynn and seconded by Mr. Rushton Parker (both ex-presidents), was passed with loud applause. Afterwards Dr. Gemmell entertained the members to refreshments and a musical programme. It is gratifying to be able to record a notable increase in the membership and associateship of the Institution during the past nine months.

ANNUAL MEDICAL SERVICE IN LIVERPOOL.

The annual medical service, held on October 17th, was conducted by the Bishop of Liverpool; the sermon was preached by Dr. J. H. Bernard, Provost of Trinity College, Dublin, who took his text from 1 John v. 21, "Keep yourselves from idols." Dr. Bernard pointed out that the object of theology and of science was the attainment and realization of truth. Seekers after truth were liable to be misled by the same false idols, the same prejudices, and the same weaknesses. The day was past for the repudiation of science by theology, and vice versa. Both spheres of knowledge were mutually subservient, and it was recognized that the mysteries of nature could not be explained completely by the researches of the laboratory. There was a good congregation, and a larger number of the profession than on previous occasions wore academic dress. The collection was made on behalf of the Royal Medical Benevolent Fund, and amounted to £49 5s. The Honorary Treasurer, Dr. J. E. Nevins, 32 Prince's Avenue, Liverpool, would be grateful if those medical men who were unavoidably absent would send their donations to him at their earliest convenience.

AN X-RAY DEPARTMENT AT BETHLEM HOSPITAL.

The *x*-ray apparatus which has been given to the Bethlem Hospital by Sir Charles C. Wakefield, president of the hospital, was formally installed on October 22nd. Sir Charles Wakefield, in welcoming the Lord Mayor, alluded to the old-standing connexions which united the ancient foundation of the Bethlem Hospital with the City of London. Mr. Lionel Faudel-Phillips, in accepting the gift on behalf of the governors, said that Bethlem and Bridewell Hospitals were very little known to the outside world. Many appeals were made for other hospitals, but few on behalf of those which dealt with the mentally afflicted. Dr. J. G. Porter Phillips, the physician and medical superintendent, said that the good work inaugurated there by Simon FitzMary had been carried out continuously since 1247. The sinister atmosphere of mystery and superstition which so often cloaked cases of mental disorder in mediaeval times had slowly given way to the common-sense teachings of medical science. Since 1863 the policy of the hospital had been to admit only cases that were presumably incurable, occurring in the educated classes. During recent years, with the aid of generous benefactions from the Goldsmiths' Company, the pathological department and its laboratories had been remodelled and research therein had been greatly facilitated. Lectures and clinical demonstrations were given at the hospital to students of St. Thomas's, University College, Guy's, the London, and the Royal Free Hospitals; it was proposed in the near future to appoint a staff of teachers and to establish the hospital as a teaching centre for those desirous of specializing in mental diseases. With the inauguration in November, 1919, of the new hospital, or department for nervous diseases, situated on the former site of the Royal South London Dispensary, the dawn of a new era in the history of the hospital had been heralded, and a means had been provided for the sister sciences of neurology and psychiatry, hitherto studied apart from each other, to flourish side by side. Here, in conformity with the teaching of modern medicine, prophylactic treatment could be carried out, and cases of the borderland type could be carefully studied. The *x*-ray apparatus presented by Sir Charles Wakefield was much needed, and in the care of Dr. Russell Reynolds, the honorary radiologist, would undoubtedly play an important part in treatment and research.

MANCHESTER EDINBURGH UNIVERSITY CLUB.

The annual dinner of the Manchester Edinburgh University Club was held on October 21st at the Queen's Hotel, Manchester, when about eighty members and guests sat down to dinner under the presidency of Dr. T. Arthur Helme. The guest of the club was Professor G. Lovell Gulland of Edinburgh University, and among the guests from the Manchester Medical School were Professors Reynolds, Wild, and Dean, Dr. Brockbank, Dr. Clegg, and Sir William Milligan, while Professors Donald and J. W. Smith, Dr. Fothergill, Mr. Garnett Wright, and others were present as members of the club. In reply to the toast of "The University of Edinburgh," proposed in happy vein by Dr. David Orr, Professor Lovell Gulland outlined the difficulties the university authorities were having in dealing with the enormous increase of medical students, and how the number of beds available for clinical instruction was being augmented by bringing every available hospital in the area within the scope of the teaching school, while a new convalescent hospital of 300 beds and great new laboratories were being built. The toast of "The Club" was proposed by Professor Wild of Manchester and replied to by the President, Dr. Helme; and Dr. Williams and Professor Wild replied to the toast of "The New Members and Guests," proposed in an amusing speech by Dr. Scott Stevenson. Old college songs, sung by Dr. Spencer Watkins and Dr. Corsar Sturrock, contributed to the gaiety of a very successful reunion.

Scotland.

THE NEW GLASGOW CLINICAL SCHOOL.

ON October 18th a school for clinical teaching in connexion with the Glasgow Victoria Infirmary was opened. The ceremony was presided over by Mr. William Gray, who explained that owing to the pressure upon the Royal and Western Infirmaries the governors of the Victoria Infirmary had been approached by the university authorities and asked whether they could provide facilities in that institution for clinical teaching. The governors at once took the matter up and obtained the ready co-operation of the medical and surgical staff. With the help of a donation of £20,000 from Mr. M'Beth the scheme had now been carried through. Sir James Mackenzie, M.D., F.R.S., then gave an address on medical education. He understood that after the pressure had been taken off the university a post-graduate school would be started. There was, he said, a widely held belief that during the last quarter of a century medicine had made great progress, but unfortunately much of what was considered progress was but change and movement without any clear understanding of what constituted science as applied to medicine. He directed attention to instances of confusion which were to be found in medicine, in education and research. The discovery of auscultation and the use of the stethoscope in detecting the sounds of the heart afforded an illustration. Though much labour had been spent in detecting the murmurs and finding out the mechanism of their production, the nature of the knowledge revealed and how it should be applied had not been understood. A similar lack of understanding would be found in the history of almost any discovery. Lister's discovery, though it had benefited humanity, had had an injurious effect upon the progress of surgery inasmuch as it had rendered surgeons careless as to the meaning of the signs and symptoms of the disease. The first step in research was the differentiation of diseases by means of the symptoms produced, and the next was the study of the circumstances which favoured or induced the onset of the disease. The clinical worker must place before the laboratory worker a clearly defined problem. Sir James Mackenzie emphasized the importance of the out-patient department in connexion with the teaching of the student. Referring to his own experience of heart affections, he said that to understand the subject of prognosis the observer had to undergo a long training and then to have the opportunity of studying not only acute cases, but those that proceeded gradually for ten or twenty or more years. When the laws governing the production of symptoms were recognized the discovery of one would guide the practitioner to search for others so that the group of symptoms peculiar to different diseases could be distinguished. Sir Donald MacAlister, in proposing a vote of thanks to Sir James Mackenzie, said that it did them good to be shaken up by such an address; it made them look to their foundations to see whether these were sound or not. He emphasized the importance of paying the closest attention to symptomatic research.

TYPHUS IN PAISLEY.

It was reported last week that there were twelve cases of typhus fever under treatment in hospital at Paisley. The outbreak is understood to be confined to the northern district of the town; several deaths have already taken place. The public health authorities have taken precautionary measures to prevent the further spread of the disease.

Correspondence.

A SOLUTION OF THE HOSPITAL PROBLEM.

Sir,—All are agreed that (1) more money and (2) more accommodation for the treatment of patients are needed. When the bill now before Parliament becomes an Act, the Ministry of Health will, it is presumed, proceed to direct the local bodies—county councils—to do its bidding, whatever it may amount to, for the provision of more hospital accommodation wherever wanted. But the Ministry, as it will not supply the money, will not be able to dictate to a local statutory body, and therefore it will be as helpless as its predecessor, the Local Government Board.

The crux of the whole problem is, Where is the money to come from? There are several sources.

1. *From Imperial Taxes.*—This source would relieve those who derive benefit from hospitals from any obligation to make provision for themselves; the injustice of this would not, under the present system of taxation, I think, be tolerated for long.

2. *From Local Rates.*—Here again the burden would be very unequally distributed, and this inequality would rapidly lead to injustice and consequent difficulties.

3. *From Voluntary Subscriptions and Donations.*—This source is dwindling, and it is likely to do so with greater and greater rapidity as the present economic changes proceed; therefore the revenue of hospitals must become less able to meet the extra expenditure on living and wages.

4. *From Compulsory Contributions out of Employers and Employees.*—This is now possible by an extension of the National Insurance Act, and it is the only source which can be made adequate and which possesses the power of elasticity varying with the hospital needs and with any increase or decrease in the population in a given area. If each of the 13,000,000 insured persons contributed 1d. per week and the employers a like sum, £5,633,333 6s. 8d., more or less, would be available each year in addition to about £1,200,000 (*Burdett's Hospitals and Charities, 1917*) derived from endowments specifically left for the benefit of the sick. In this way money could be got regularly and the sum available for a given period could be estimated and the future expenditure based upon it. The present total annual expenditure on the voluntary hospitals cannot be estimated at less than £4,000,000.

This last appears to me the only source of revenue for the hospitals that gives promise of adequate support and proper provision for all our sick and injured, and, in addition, suitable accommodation for children and for maternity cases which should no longer be entirely left to the care of a midwife, and often in a house totally unfit for the woman to be in during her recovery and convalescence.

If the money were obtained from employers and employees by direction of the State, thus ensuring that each worker and each employer paid their proportion, the government of the hospitals should be shared by each party. The Ministry should, I think, take up the control and maintenance of buildings, the erection of new ones, the appointment of managers, of doctors and nurses, and of supplies of all kinds. The insured and the employers should, on the other hand, undertake the social care of the patients, and see to all amenities that help to reduce the disadvantages attending residence in hospital. Thus the hospital needs of insured persons would be provided for.

There would, however, appear to be no reason why all employers of labour, the professional classes and others should not avail themselves of the advantages such hospitals would afford. For this all that these classes would need do is to co-operate and ask under what conditions and circumstances they could insure under an extended national insurance scheme. They could thus share with the working classes the enormous advantages of treatment for disease or injury in large and well equipped public institutions, and at a very moderate cost. Special provision might be made to meet their social needs; if so an adequate addition to their premium would be necessary.

I believe a sound hospital service could be arranged on some such lines for all members of the community that desired to avail themselves of it; and with hospitals of large size in suitable and convenient centres, and the easy transport facilities of to-day the treatment of serious injuries and disease would no doubt be very greatly improved. In such a scheme the general practitioner should be able to retain contact with the patient of whatever grade in social life, and he should be given facilities to watch the treatment in the hands of the specialist. Hospital service should, I believe, be arranged so that the general practitioner feels he is an integral part of the organization. He should have the right to visit his patient and to consult with the specialist concerned in the treatment of his case; this would, I am convinced, be advantageous to both patients and doctors. The general practitioner could in such large hospitals be afforded, from time to time, facilities for clinical practice, observation, and opportunities for study without expense and with no loss of income.

In conclusion, may I say that I sincerely trust the above suggestion will receive due consideration from the Ministry of Health and from the profession; for upon the right solution of the hospital problem largely depends the future progress of medicine and surgery in all their branches in this country.—I am, etc.,

Cambridge, Oct. 25th. Joseph Griffiths.

THE FUNCTION OF MUCUS.

Sir,—The remarks on this subject by Mr. Benians and by Dr. Crookshank suggest the difficulties encountered in connexion with the mucins and "mucoids," which have such a wide distribution in the animal body. That Mr. Benians is right in attributing to the surface mucus a barrier action in respect of toxic ferments and bacteria is proved by the fact that glucosamin — the nitrogen-containing carbohydrate of mucin—is not fermentable with yeast, and is not affected by the oxidizing and dissociating ferments of mammals (Fabian and others). The mucins are also very resistant to putrefaction, and it was affirmed by Cohnheim that "their peculiar physiological property makes the entrance of putrefactive bacteria a difficult matter, while bactericidal bodies may also play a part." It is a curious fact, however, that certain bacteria secrete a true mucus.

But a consideration of the structure of mucin and its distribution in the organism leads one to adopt a wider conception of its functions. In a paper published in the Journal, vol. i, 1908, p. 369, I ventured to express the opinion that the mucous glands (which are deeply embedded in the mucous membrane) minister in some way to the growth and development of the pertaining organs, and thereafter assist in maintaining their physiological fitness—possibly by an internal secretion, or by regulating the cell ferments by some internal action. It was also pointed out how mucus differed in its relative component parts and in its reactions in different situations, and how the structure of mucin was of such a complexity as to suggest a recondite function. As a matter of fact, the structure of mucin has not yet been elucidated. We know that it contains a protein radical *plus* glucosamin, but the glucosamin is not contained in the molecule as such, only in a more complex form. This carbohydrate group is very rich in oxygen. Mucin also contains a large amount of sulphur. The precise stereo-chemical position of the amino group is as yet undetermined.

Again, we find that in the body mucin is present not only as a product of epithelial cells, but also (often referred to as "mucoid") in the interstices of connective tissue, between individual cells, in cartilage, in bone, in the blood serum, in the eye, etc.; and it exists in white of egg as ovi-mucoid.

Evidently, therefore, the domain of mucin is of high importance and of unusual range. And yet there is no substance or secretion about which we know less.—I am, etc.,

London, W., Oct. 23rd. A. G. Auld.

EMETINE IN BILHARZIASIS.

Sir,—In reply to Dr. Esser's letter which appeared in the Journal for October 23rd I append a list of references to papers dealing with the use of emetine in bilharziasis, both in Egypt and elsewhere.

It is evident that the drug has been given a considerable trial, but possibly sufficient evidence has not yet been adduced to warrant its substitution for antimony. Of the observations cited the most suggestive would appear to be those of Erian, who states that in Egypt he has had fifty recoveries with not a single failure, *in cases suitable for treatment.* (The italics are not in the original.) In many instances although a period of more than a year had elapsed since treatment was commenced there had been no return of the haematuria. The drug was given by intramuscular injection in doses which apparently varied

from 0.1 gram (1.54 grains) to 0.2 gram (3.08 grains). The author believes that emetine actually kills the worms, for the ova disappear from the urine.

Emetine can be administered intravenously, but is not very suitable for this form of medication and must be given with care. The dosage is ½ to ⅔ grain in 5 c.cm. normal saline. Dale has pointed out that when given in this way emetine exhibits its greatest toxicity, while there is no advantage from the standpoint of therapeutic efficacy. Still it may be noted that Diamantis of Cairo treated his cases by intravenous injection, giving doses varying from 0.02 to 0.1 gram at intervals of two or three days, fifteen to twenty injections in all being usually given. He considers simple, non-septic cases suitable for this method.

I note that Dr. Esser thinks the intravenous route more convenient than the subcutaneous or intramuscular. I confess one of the reasons which made me refer to the emetine treatment of bilharziasis was that I felt it would be helpful and convenient if we possessed a reliable drug which could be administered by some other method than intravenously, especially in countries where facilities for such a line of treatment are poor or lacking. Both Erian and Debbas prefer intramuscular injections.

As I said at the meeting of the British Medical Association, the fact that such very different substances as emetine and antimony have apparently a similar action in schistosomiasis and leishmaniasis is of great pharmacological interest and certainly merits further inquiry. At the same time more extended observations are required as regards the value of emetine in bilharziasis, and if Dr. Esser and others working in bilharzia-stricken districts in South Africa would give the drug a trial and record their results, it would be helpful, whether the latter confirm or confute those already published.—I am, etc.,

ANDREW BALFOUR.

Wellcome Bureau of Scientific Research,
25-27, Endsleigh Gardens, N.W.1, Oct. 25th.

Bonne, C.: Has emetine any influence on the schistosomes? *Trans. Soc. Trop. Med. and Hyg.*, 1919, vol. 12, No. 4, p. 82.

Collignon and Monziols: Un cas de Bilharziose vésicale traité par des injections sous-cutanées de chlorhydrate d'émétine. *Bull. et Mém. Soc. Méd. Hôpit. de Paris*, 1919, vol. 35, p. 796. (Rev. in *Tropical Diseases Bulletin*, 1920, vol. 15, No. 3, p. 220.)

Debbas, E.: Contribution au traitement de la Bilharziose urinaire. *Presse méd. d'Égypte*, Feb. 1st, 1920, vol. 11, p. 115. (Rev. BRITISH MEDICAL JOURNAL Epitome, May 8th, 1920, p. 74.)

Diamantis: Sur un nouveau traitement de l'hématurie bilharzienne en Egypte. *Journ. d'Urologie*, 1917, vol. 7, p. 17. (Rev. *Trop. Dis. Bull.*, 1918, vol. 11, p. 81.) Note sur le traitement de la Bilharziose urinaire par le chlorhydrate d'émétine. *Presse méd. d'Égypte*, January 1st, 1920, vol. 11, p. 91. (Rev. in Epitome, BRITISH MEDICAL JOURNAL, February 28th, 1920, p. 33.)

Erian, A.: The treatment of bilharziosis by massive doses of emetine. *Practitioner*, 1919, vol. 103, p. 391. (Rev. *Trop. Dis. Bull.*, 1920, vol. 15, No. 3, p. 220.)

Mayer, M.: Behandlung der Bilharziakrankheit. mit Emetin. *Muench. med. Woch.*, 1918, vol. 65, p. 612. (Rev. *Trop. Dis. Bull.*, 1918, vol. 12, p. 169.)

MUSCLE RE-EDUCATION IN INFANTILE PARALYSIS.

SIR,—I have read with great interest Dr. Charles Mackay's communication on "The place of muscle re-education in the treatment of anterior poliomyelitis," which appeared in the BRITISH MEDICAL JOURNAL of October 2nd, and am very glad to see that he once again draws attention to this treatment of the condition. I cannot, however, agree with him when he states (p. 513) that

> muscle re-education is an entity quite distinct from the routine physical therapeutic procedures of . . . and Swedish remedial exercises.

He goes on to say that the term muscle re-education means (p. 514)

> the gradual stimulation, and slow awakening to activity, of the voluntary motor impulse which has been lying dormant . . . and muscle re-education aims at restoration of the continuity of the motor impulse and the re-establishment at the earliest possible moment of co-ordination with the almost intact muscle system.

Now this excellent description is exactly the aim of Swedish remedial exercises when applied to infantile paralysis. They are then for the most part applied in the form of resisted exercises to isolated groups of muscles or even individual muscles, and to my mind are the best method of muscle re-education at our disposal.

Dr. Mackay also states (p. 514):

> Muscle re-education . . . refuses to be prevented by the knowledge that the nerve cells may have been grossly injured from attempting to secure recovery of muscle function,

and he considers that the conception of the importance of muscles is new. This is not the case; it has been known to the Swedish school for nearly a century, and was one of the fundamental bases on which Ling and Branting modelled their gymnastic exercises (mostly resisted movements) in the treatment of the disease under consideration.

For further details on mechano-therapeutics in infantile paralysis I refer the reader to an article by myself, published in the *British Journal of Children's Diseases* for 1914 (ix, 155).—I am, etc.,

London, W., Oct. 20th. EDGAR F. CYRIAX, M.D.Edin.

TUBERCULOUS MILK.

SIR,—If I may judge from conversations I have had with medical men in recent years on this subject, the view "that the ingestion of a moderate amount of tuberculous poison during childhood may have an immunizing effect in the long run" appears to be more widely held than one would at first imagine. Dr. Nicol Galbraith aptly calls attention to the 10,000 children under five years of age who die annually in England and Wales from tuberculosis, who have evidently ingested an immoderate amount of tuberculous poison. There is no way, however, of ensuring that children should ingest only the moderate amount of poison suggested by Dr. Paterson. If immunization from this source takes place in childhood, why should it not also continue to take place in adult life?

About fifteen years ago bovine tuberculosis was introduced into Guernsey by some cattle which had been sent to a show in England and afterwards returned to the island. Drastic legislation has now stamped it out. Under no circumstances whatever can cattle be landed in Guernsey save from Alderney and Sark, unless taken immediately to the States' abattoir for slaughter, and no cattle can be exported, sold, or transferred from one farm or island to another unless they have been tested and found to be free within the preceding four months.

The results have been most satisfactory, for in the year ended August 31st, 1920, 1,582 cattle were tested for tuberculosis, and there was not a single reaction. Our population, therefore, drinks now no tuberculous milk, and even fifteen years ago drank only a very small proportion of the quantity which is consumed in England. It is therefore deprived of the benefit (?) of immunization; yet abdominal, joint, and glandular tuberculosis is conspicuous by its absence, and death rates from tuberculosis in Guernsey are much lower than in countries which enjoy the benefits of tuberculous milk.

I entirely agree with Dr. Nicol Galbraith's letter. The last paragraph of it is non-controversial; it is just sound common sense.—I am, etc.,

H. D. BISHOP,
October 18th. M.O.H. States of Guernsey.

GOVERNMENT SUBSIDIES AND THE NATIONAL HEALTH.

SIR,—Dr. Addison's bill—the Ministry of Health (Miscellaneous Provisions) Bill—which proposes to subsidize the hospitals from the rates, raises for us two questions: (1) What is the total effect (the partial effect being obvious) on the health of the community at large of such subsidies? and (2) What should be the attitude of the medical profession to such proposal—if, indeed, the profession has been consulted at all?

I had hoped that there might have been at the Representative Meeting a discussion on first principles as to whether the undeniable and the foreseen rise in our tuberculous mortality was related to the Insurance Act. The hope was for the time baffled; as a whole, Representatives seemed content to accept without question the measures of a party which, so far from "educating our masters"—as Lowe advised—humbly sits at their feet and learns. But I found a gratifying number of sympathizers, and learned, moreover, that everyone who had gone into the subject saw that in measures of that kind there must be a menace to the very class—the poor—which they are meant to help. There are written large in history the facts that every fall in the death rate has been preceded by a rise in real wages, and that every fall in real wages has been followed by a rise, at least relative, in that rate; and I have found no fair-minded man cognizant of the

facts who does not advocate a scientific inquiry. What is true of tuberculosis is plainly true of other diseases dependent on malnutrition.

The Insurance Act was meant to check consumption; if its premisses were correct, it should have done so; it has disastrously failed. It is childish to blame the war for the culmination of a process nearly twenty years old. The war has, indeed, illustrated our position, while it has glossed over the effects of the Insurance Act. Other classes—for example, the inmates of the lunatic asylums—died faster in the later years; but evidence is constantly accumulating that after 1915 (that is, after money wages had overtaken prices so that poverty was abolished) among "the poor" the tuberculosis mortality (civil) actually diminished up to the end of the war. Under such conditions a wise man would pause to investigate before he extended the principle of governmental subsidies, by way of improving national health. But the deputies of Providence "who sit up aloft" round about Whitehall and "watch over our lives" have no need of mundane wisdom. The poor were dying of consumption; they must have a series of Insurance Acts; whereupon the ingrates died faster still. Taxation has made us all poorer, commodities dearer, and thrown the hospitals into straits; *ergo*, we must be taxed more. The hospitals were meant for the poor; they used to cost the poor no penny which they did not voluntarily spare: therefore an extra burden must be put on the poor; they are to be chastised with scorpions instead of whips.

For that, in plain English, is what the Ministry's bill means; it proposes to throw a burden on the poor which had been voluntarily shouldered by the well-to-do. No means of keeping taxation off the shoulders of the poor has ever been found; the miners are poorer to-day *because* the Government nine months ago cut of taxes raised their money wages. Until the question of the incidence of taxation is settled, to put the hospitals on the rates is a wicked wrong to the poor. Until they have explained the inevitable association of rising poverty with rising rates or taxes, or the gradual slackening of the rate of fall of our tuberculous mortality as taxation rose, the Ministry of Health are bound by the very pity which prompts them to these megalomaniac schemes to inquire what will be their total effect.

I have reason to believe that Dr. Addison's bill has not been referred to the Consultative Council. If that is so, may I beg those who sympathize with the position that no measures (especially at this awful time) which act in restraint of real wages can possibly effect an improvement in the national health, to do all they possibly can to ensure that that Council shall be consulted without delay? or, failing that, to ensure that the Council should ultroneously advise the Ministry?—I am, etc.,

Rayleigh, Essex, Oct. 21st. B. G. M. BASKETT.

THE MOBILE PROXIMAL COLON.

SIR,—I recently had occasion to resect a portion of the transverse colon on account of the presence of a deep ulcer which was so evidently caused by mechanical traction that it may be taken as affording indirect support to Mr. Waugh's theory that the drag of an abnormally mobile ascending colon may be a cause of ulceration of the duodenum. A man of 50 complained of symptoms that made one suspect the presence of a malignant growth in the colon; he also had an irreducible inguinal hernia of long standing. At the operation a mass of omentum was found incarcerated in the right inguinal canal and the omentum itself was thickened into a stout band along the line of traction between the herniated portion and the transverse colon. The latter was drawn downwards and sharply kinked at the point of attachment of this thickened band. A deep ulcer was found in the kinked portion. In this case it seems clear that traction was responsible for the formation of the ulcer. A somewhat similar mechanical effect, though less extreme, might be exerted upon the duodenum by a mobile proximal colon, and predispose to ulceration.—I am, etc.,

Leicester, Oct. 25th. T. C. CLARE.

SIR,—May I ask you to be good enough to correct a misprint that has crept into my letter in reply to Mr. Waugh, which appears in to-day's issue of the JOURNAL? The sentence, "The distribution of duodenal ulcers in his series, and Mr. Waugh's definite statement as to their usual distribution, are so much at variance with the experience of *the* surgeons," etc., should read, "the experience of *other* surgeons."

The error is obviously due to the fact that you had not sufficient time to send me a proof, but the effect of it is most unfortunate, and I should be glad if you would correct it in your next issue.—I am, etc.,

Manchester, Oct. 23rd. JOHN MORLEY.

Obituary.

SAMUEL SLOAN, M.D.,

Glasgow.

WE regret to record the death of Dr. Samuel Sloan, which took place at his residence in Glasgow on October 17th, after a brief illness. Born in Glasgow in 1843, Dr. Sloan received his education at the High School and University of Glasgow; he graduated M.B., C.M. in 1866 with commendation, M.D. in 1870, and F.R.F.P.S.Glasg. in 1877. For many years he enjoyed an extensive practice in Glasgow and the neighbourhood. Dr. Sloan had special interests in many branches of medical science—notably midwifery, gynaecology, and electro-therapeutics; he was connected with the Glasgow Hospital for Diseases of Women as a teacher and as a visiting physician, and was consulting physician successively to the Samaritan and Maternity Hospitals. His numerous students bear testimony to the benefits they derived from his tuition. He had acted as examiner in midwifery and gynaecology at Glasgow University, and in the Royal Faculty of Physicians and Surgeons, and was a past president of the Electro-therapeutic Section of the Royal Society of Medicine. He was President of the Glasgow Obstetrical and Gynaecological Society from 1908 to 1912. Dr. Sloan was the author of "Treatment of labour delayed by obstruction at pelvic brim," "Ionic medication in treatment of obstinate cases of pelvic diseases in women," "Physiological effects of high-frequency currents in disease," as well as numerous other papers on kindred subjects. His book on *Electro-therapy in Gynaecology*, published in 1917, is a well known and standard work containing a record of much valuable original investigation. At the time of his last illness he was busily engaged in revising a new edition of this book. He was an excellent mechanic and constructed many of his own instruments; one of his pleasures was to survey the planets with a telescope to which he had adapted various mechanical appliances with his own hands. Dr. Sloan was a man of most exceptional energy, and in the leisure left him by the very exacting demands of his practice he found recreation in the study of zoology, astronomy, and scientific photography. He was a genial, unassuming, and kindly man, and highly respected by a large circle of friends. He is survived by his widow and a numerous family, three of whom are well known members of the medical profession—his namesake, Dr. Samuel Macfarlane Sloan of Birmingham, Colonel John Macfarlane Sloan, C.M.G., D.S.O., and Mrs. Elizabeth Sloan Chesser, M.D., of Harley Street, London. One of his sons was killed in the late war. Dr. Sloan was buried in the Glasgow Necropolis.

Dr. JOHN RITCHIE writes: As one who had for many years acted for Dr. Samuel Sloan during his annual summer holiday, who had derived counsel and inspiration from his bright and cheering advice, and had received many kindnesses at his hands, I should like to pay a brief tribute to his memory. Dr. Sloan's capacity and zeal for work were enormous. Possessed of good health, a retentive memory, exact and methodical habits, he overtook the duties of a large and widely scattered practice in a way that many of us failed to comprehend. It was said of him at one time that he lived in his carriage. At all events, it sometimes taxed the powers of three pairs of horses to carry him over his rounds in a day. He was a very well-read man, and there were few subjects, not only in medicine, but in most of the allied subjects, regarding which he was not able to speak, and to speak well and fluently. During his later years he devoted great attention to electro-therapeutics. Dr. Sloan used to say that the real object of a holiday was to make oneself better able to

do his duty, and that if the holiday did not produce this effect it had better not be taken. He was pure and upright in his ways, and he was deeply religious, though some were surprised at the views which he expressed. He was a living sermon on the text "Whatsoever thy hand findeth to do, do it with all thy might."

Another colleague, "W. G. D.," sends the following personal appreciation: Dr. Samuel Sloan was a man of striking physical appearance, tall, erect, and quick and active in his movements. He certainly looked ten years younger than his age, and many of us must have been astonished to learn that he was in his 78th year. He was of a bright, happy disposition, and while he, like Dr. Peter Low, "cured many while he lived . . . of his God he got the grace to live in mirth and die in peace." I am sure that by his bright and hopeful manner Dr. Sloan brought comfort and healing to many a stricken soul. Whilst distinguished as an obstetrician and electrical therapeutist, Dr. Sloan took a great interest in biological questions, and particularly in marine biology, making a practical study of this on the shores of the Island of Bute, where he had a house, and where he regularly spent the week-end all the year round. He made a study also of astronomy, and nothing pleased him more than, in the company of a congenial friend, to survey with his astronomical telescope the starry heavens. He was an excellent conversationalist, and his friendship will be missed by many.

ROBERT KIRK, M.D.EDIN.

DR. ROBERT KIRK of Rowan Bank, Bathgate, Linlithgowshire, was one of a number of distinguished men who during the last forty years settled in country practices in the neighbourhood of Edinburgh.

After studying in Edinburgh University he took the degrees of M.B. and C.M. in 1876, and in the same year became a Licentiate of the Royal College of Physicians; in 1879 he graduated M.D. with honours, and two years later he became a Fellow of the Royal College of Surgeons of Edinburgh. He was a president of the Royal Medical Society, and held various posts in the Royal Infirmary. His interest in the scholarly aspects of medicine was shown by his being a member of the Harveian, the Obstetrical, and of the Botanical Societies of Edinburgh. He settled in Bathgate, the birthplace of Sir James Simpson and of John Reid, the physiologist, and soon established a great reputation there. He was parochial medical officer, medical officer of health, and public vaccinator for Bathgate, and a J.P. for Linlithgowshire, as well as surgeon to the post-office; and he took a great interest in the R.A.M.C., in which he was lieutenant-colonel, and had a Volunteer Decoration. He also had a large and influential private practice in and around Bathgate. He was a keen curler, and greatly enjoyed his game of golf.

Dr. Kirk died at Crieff on October 16th, and was buried on the 19th at Bathgate. He will be greatly missed by the many patients who made up his practice.

Universities and Colleges.

UNIVERSITY OF LONDON.

Proposed New Site.

AT its meeting on October 20th the Senate, after considering a report of the Site and Accommodation Committee and the correspondence which has passed between the Vice-Chancellor, Dr. S. Russell Wells, and the President of the Board of Education, resolved to accept the offer of His Majesty's Government of the site to the north of the British Museum, in accordance with the terms of Mr. Fisher's letter of April 7th, 1920.

The site is to be provided gratis and in perpetuity on the terms as regards the maintenance, rates, etc., of the University head quarters buildings laid down in the Treasury Minutes of February 16th and July 13th, 1899, and in Mr. Fisher's letters of June 26th, September 24th, and October 6th, 1920, to the Vice-Chancellor, which provided:

1. That such grant for maintenance, rates, etc., shall not be counted as a portion of the grants made to universities for educational purposes.

2. That the allocation of the site between the various buildings to be erected thereon shall be at the sole discretion of the Senate of the University.

3. That the University shall retain, and King's College shall retain, full possession of their present sites and buildings under the conditions under which they now hold them until such time as the new buildings are ready for occupation and are free from debt.

4. That the buildings to be erected for the University head quarters shall be, as regards dimensions and design, in accordance with plans to be agreed upon between the Senate and His Majesty's Treasury, and shall afford not less than 50 per cent. more floor space than is now allocated in the buildings at South Kensington for the separate use of the University.

5. That the terms of the removal of King's College from the Strand to the Bloomsbury site shall be a matter of subsequent negotiation between His Majesty's Government, the council of King's College, and the Senate of the University, and that an agreement shall be concluded between the said parties.

The Senate, in accepting, subject to the above conditions, the Government's offer of a site in Bloomsbury, assume that the offer does not incidentally involve a policy of curtailing the development of the work of those colleges and schools of the University which are not now, nor in the future will be, situated in the neighbourhood of the Bloomsbury site, and that these institutions will not receive less favourable consideration at the hands of the Government than would otherwise have been the case.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.

THE annual meeting of Fellows and Members will be held at the College in Lincoln's Inn Fields on Thursday, November 18th, at 3 p.m., when a report of the Council will be laid before the meeting. Fellows and Members can obtain copies of the report on application to the secretary. Motions to be brought forward at the meeting must be signed by the mover, and be received by the secretary not later than November 8th. A printed copy of the agenda will be issued to any Fellow or Member who applies for it.

ROYAL COLLEGE OF SURGEONS OF EDINBURGH.

AT a meeting of the Royal College of Surgeons of Edinburgh, held on October 20th, Dr. George Mackay was re-elected president, Dr. R. McKenzie Johnston vice-president, and Mr. Alexander Miles secretary and treasurer.

The following candidates, having passed the requisite examinations, have been admitted as Fellows:

E. G. Anderson, Captain N.Z.M.C., W. B. G. Angus, O.B.E., M.C., S. Batchelor, A. J. Caird, C. L. Chapman, D.S.O., Lieut.-Colonel A.A.M.C., G. W. Christie, B. K. T. Collins, W. F. Currie, J. K. Datta, N. H. Dempster, H. M. Desai, J. L. Diggle, O. Ellis, D. S. Falconer, K. G. Fraser, A. Goodwin, E. A. Guymer, Major A.A.M.C., Alice M. Headwards, J. M'A. Holmes, Surgeon Commander R.N., A. M. Jones, J. T. Kyle, J H. Lechler, J. Lyons, D. McIntyre, D. McVicker, Captain R.A.M.C., H. H. McWilliams, Major A.A.M.C., G. E. Martin, T. A. Milroy, Captain N.Z.M.C., A. R. Moodie, W. Morris, K. D. Panton, Lieut.-Colonel C.A.M.C., W. C. Paton, Brevet Major I.M.S., R. Richards, G. Richardson, J. S. Taylor, J. H. Tennent, B. Thomas, W. A. Thompson, C. H. Vernon, D. G. Wishart, M. Yuille, Major A.A.M.C.

Miss Alice M. Headwards is the first woman admitted to the Fellowship of the Royal College of Surgeons of Edinburgh.

The Services.

HONOURS.

FOREIGN DECORATIONS.

THE following decorations have been conferred by the Allied Powers in recognition of valuable services during the war:

By the King of the Belgians.—Cross of Officer of the Crown of Belgium: Sir George T. Beatson, K.C.B., K.B.E. (for services rendered as President of the Scottish Branch of the British Red Cross Society).

By the President of the French Republic.—Croix de Guerre: Colonel Arthur M. Connell, A.M.S., T.F.(ret.); Surgeon Lieutenant E. G. S. Slesinger, O.B.E., R.N. *By the King of Hellenes.*—Order of George I, Commander: Major J. Utting, R.A.M.C.(T.F.), ex-Lord Mayor of Liverpool. *By the King of Rumania.*—Order of the Crown of Rumania, Commander: Sir W. R. Smith, ex-Sheriff of the City of London. *By the King of the Serbs, Croates, and Slovenes.*—Order of the White Eagle (*Fifth Class*): Brevet Major William Bentley Purchase, M.C., R.A.M.C. Order of St. Sava (*Third Class*): Brevet Colonel Harold Hugh Norman, R.A.M.C.; Lieut.-Colonels Robert James William Oswald, O.B.E., R.A.M.C.(T.F.), Alexander Brodie Seton Stewart, R.A.M.C. (T.F.), Sir Nestor Isidor Charles Tirard, late R.A.M.C.(T.F.), temporary Major (acting Lieut.-Colonel) H. W. Marett Tims, O.B.E., R.A.M.C. (*Fourth Class*): Temporary Captain Augustus William Tabuteau, R.A.M.C. (*Fifth Class*): Temporary Captain Eustace Robert Barton, R.A.M.C.

DEATHS IN THE SERVICES.

Lieut.-Colonel Thomas Edward Noding, R.A.M.C. (retired), died in London on September 28th. He was born in Trinidad on May 25th, 1858, took the M.R.C.S. and the L.R.C.P.Ed. in 1880, and entered the army as surgeon on July 30th, 1881, becoming lieutenant-colonel after twenty years' service, and retiring on May 25th, 1913. He served in the Egyptian war of 1882, gaining the medal and the Khedive's bronze star; and on the North-West Frontier of India in the Waziristan campaign of 1894–5, receiving the Frontier medal with a clasp. He also rejoined for service during the recent war.

Medical News.

THE Home Secretary is about to appoint a whole-time inspector under the Cruelty to Animals Act, 1876. The appointment will be for a term of three years in the first instance. The salary will be £800 a year, together with war bonus on the Civil Service scale, and travelling allowances at the usual Civil Service rate. Candidates who possess the scientific qualifications required for the work, and are not over 50 years of age, should apply, before November 10th, to the Private Secretary, Home Office, Whitehall, London, S.W.1., from whom further information may be obtained. Applications should be accompanied by one or two testimonials and particulars of the candidate's qualifications.

LORD PHILLIMORE presided recently at a conference of representatives of professional institutions and benevolent funds and other bodies in touch with the professional classes. It was reported that the Professional Classes War Relief Council had decided upon a scheme of reconstruction in order to become a permanent body for dealing with post-war distress among professional men and women and others of the more highly educated classes. The conference warmly supported this action on their part, and a resolution was adopted, urging all bodies in touch with the professional classes to recognize the council and to avail themselves of its services when likely to be of use.

THE winter session of the Liverpool Literary and Philosophical Society was opened on October 18th by a presidential address by Sir James Barr on "The philosophy of Immanuel Kant"—a thoughtful analysis of the higher conception of life to which men are led by intuition and of the grounds for belief in a future existence, made with characteristic vigour and fertility of illustration.

THE Glasgow Post-Graduate Medical Association has arranged a programme of weekly demonstrations for practitioners during the session 1920–21. The demonstrations will be given on Wednesday afternoons at 4.15 o'clock from November 17th to December 22nd, and from January 12th to May 25th inclusive. The fee for the series is £3 3s., payable to the Secretary, Dr. A. M. Kennedy, Post-Graduate Medical Association, The University, Glasgow.

DR. TEMISTOCLE ZAMMIT, C.M.G., Rector of the University of Malta, has been appointed a member of the Executive Council and of the Council of Government of Malta.

THE Kingston-on-Thames Town Council has unanimously resolved to put forward the name of Alderman W. E. St.L. Finny, J.P., M.D., M.Ch., for election as mayor. Dr. Finny has previously been mayor in 1898, 1901, and 1908.

DR. ARTHUR KEITH, F.R.S., will be the chief guest at the Authors' Club dinner on November 8th, to be presided over by Mr. Morley Roberts, and will speak on the antiquity of man.

SIR WILLIAM and LADY LISTER have sent a donation of £5,000 to the Royal London Ophthalmic Hospital for the purpose of starting an ophthalmic convalescent home in connexion with the hospital.

MESSRS. CHRISTOPHERS will shortly publish a book by Mr. A. H. Tubby, entitled *A Consulting Surgeon in the Near East*. The work details his experiences as a consulting surgeon in Gallipoli and Egypt from 1915–1919.

CHAIRS of oto-rhino-laryngology have been recently created at the Universities of Lyons, Montpellier, and Nancy, Drs. Jacques, Lannois, and Mouret having been appointed professors.

THE second International Congress of Comparative Pathology will be held at Rome in April, 1921. An organizing committee has been established under the presidency of Professor Perroncito, composed of Professors Ascoli, Golgi, Grassi, Lustig, Marchiafava, Paterno, Raffaele, Sanarelli, and Colonel Bertoletti. Among the subjects to be discussed are influenza in man and animals, foot-and-mouth disease, recent researches in sarcoma and carcinoma, rabies and antirabic vaccination, piroplasmosis, acari, and scabies in man and animals, and phylloxera. Subscriptions of membership (20 lire) and abstracts of papers should be sent to the secretary, Professor Mario Levi della Vida, Via Palermo 58, Rome, by December 15th.

A MONUMENT has been erected at Castera-Verduzan, Gers, France, to the memory of the celebrated French surgeon and pathologist, Lannelongue, who died in 1911.

A SCHOOL of dental medicine and dental prosthesis will be opened at the University of Bologna on November 5th.

THE opening of the winter session at the Central London Throat and Ear Hospital, Gray's Inn Road, will take place at 4 p.m. on Wednesday, November 3rd, when Sir James Dundas-Grant will deliver the introductory address, "Oto-laryngological Reminiscences and their Lessons:" The annual dinner of the medical staff will take place on the same evening at the Trocadero Restaurant.

PROFESSOR F. F. ROGET of Geneva gave his second Chadwick Lecture on October 25th, in continuation of the topic "Health, the Red Cross, and the League of Nations" (BRITISH MEDICAL JOURNAL, October 23rd, p. 639). Sir James Crichton-Browne, Chadwick Trustee, presided. The lecturer examined further the views set forth at the Cannes Conference of 1919 for the turning of the activities of the Red Cross Societies from the path of military emergencies into the channel opened up by the covenanted peace of the world projected by the League of Nations. He showed the health experts assembled at Cannes taking into consideration the obstacles which ignorance and prejudice put in the way of any direct attack upon many bad habits of the public in the matter of hygiene and sanitation. The whole scheme had in view the building up of a collective "hygienic conscience" in the multitude. The public showed itself indifferent to the contracting of certain widespread diseases. Those who knowingly contracted or spread diseases should be penalized. A sense of moral wrong done to the community ought to attach to the neglect of precautions calculated to limit the incidence of disease. A complete care of public health was not possible unless one conceived, in this respect, each human being as forming a single unit, through combination of soul, conscience, and body. Public sanitation rested upon universal and anthropological facts. Neither racial characteristics nor nationalistic prepossession could find room in the work of the League of Red Cross Societies.

THE eleventh meeting of the Italian Society of Orthopaedics will be held at Rome on November 5th in the Policlinico Umberto I. The following subjects will be discussed: The orthopaedic treatment of rigidity and ankylosis, the treatment of spastic paralysis, and the modern treatment of the sequelae of acute anterior poliomyelitis.

A MEMORIAL in honour of the Belgian medical men killed in the war is to be erected in the Parc Leopold, Brussels.

Letters, Notes, and Answers.

As, owing to printing difficulties, the JOURNAL *must be sent to press earlier than hitherto, it is essential that communications intended for the current issue should be received by the first post on Tuesday, and lengthy documents on Monday.*

AUTHORS desiring reprints of their articles published in the BRITISH MEDICAL JOURNAL are requested to communicate with the Office, 429, Strand, W.C.2, on receipt of proof.

IN order to avoid delay, it is particularly requested that ALL letters on the editorial business of the JOURNAL be addressed to the Editor at the Office of the JOURNAL.

THE postal address of the BRITISH MEDICAL ASSOCIATION and BRITISH MEDICAL JOURNAL is 429, Strand, London, W.C.2. The telegraphic addresses are:

1. EDITOR of the BRITISH MEDICAL JOURNAL, *Aitiology, Westrand, London*; telephone, 2630, Gerrard.
2. FINANCIAL SECRETARY AND BUSINESS MANAGER (Advertisements, etc.), *Articulate, Westrand, London*; telephone, 2630, Gerrard.
3. MEDICAL SECRETARY, *Medisecra, Westrand, London*; telephone, 2630, Gerrard. The address of the Irish Office of the British Medical Association is 16, South Frederick Street, Dublin (telegrams: *Bacillus, Dublin*; telephone, 4737, Dublin), and of the Scottish Office, 6, Rutland Square, Edinburgh (telegrams: *Associate, Edinburgh*; telephone, 4361, Central).

QUERIES AND ANSWERS.

DR. L. A. FRANCIS (Uxbridge) wishes for information as to the working of an *x*-ray apparatus in a small cottage hospital, more particularly (1) the initial cost, and (2) the annual expense.

CAPTAIN W. R. D. HAMILTON, R.A.M.C. (Clonakilty, co. Cork), writes: Could any reader give me a method of removing or partially obliterating tattoo marks with the least possible disfigurement?

"S. C." inquires where the kata-thermometer, used by Professor Leonard Hill in his investigations on ventilation and described in his report, may be obtained.

*** We are informed that the maker of this instrument is J. Hicks, 8, Hatton Garden, London, E.C.

INCOME TAX.

"FOREIGN PENSIONER" inquires whether the relief to earned income applies to a pension received for twenty years' service under a foreign government; no pecuniary contributions were made towards the pension by our correspondent.

*** We do not think that there can be much doubt about the point. The pension is clearly "earned" in respect of past services, and the fact that it is paid by a foreign government and not from British funds seems quite immaterial. That fact may very well necessitate its assessment under Schedule D Case VI instead of under Schedule E, but the rule as to earned income would still apply.

"C. C. F." (Soton) has received an assessment notice showing that the gross amounts assessed are in accordance with his return, but not showing the deduction of various allowances due to him.

*** The return, so far as civil earnings are concerned, was based on the amount receivable for the period from November 27th, 1919, the date of demobilization, to April 5th, 1920. If our correspondent's practice was kept in being during his period of military service, either by a locumtenent or by the assistance of his colleagues, the amount to be returned for assessment would be the average profits of the practice for the three years 1917, 1918, and 1919; if not, then the liability is in respect of twelve months' earnings at the present rate. It may well be that £110, the amount returned, is sufficiently near to the average liability for practical purposes. On that assumption the assessment should work out as follows:

		£	s.	d.
Untaxed income—Earned £110, less £11 (=1/10th) ...		99	0	0
From investments		109	0	0
		208	0	0
Allowances—Self and wife ...	£225 0 0			
Child	36 0 0	—261	0	0

And life assurance £27 at 3s. = £4 1 0

On these figures no tax is due in respect of the untaxed income, but, on the other hand, tax, deducted at the source on the other investment income, is due for repayment at the end of this financial year as follows:

On allowances—			
£251 – £208 = £53 at 6s.	15	18	0
Life assurance £27 at 3s. ...	4	1	0
	19	19	1
And on £225 at 3s.	33	15	0
Total	53	14	1

FURUNCLE OF ANTERIOR NARES.

DR. LEONARD J. KIDD (London, N.W.) writes: Let "M.D.," who asks for suggestions as to the treatment of staphylococcal boils inside the nostrils, try calcium sulphide gr. 1/5 bis die, p.c., either in pill, or preferably as powder triturated with gr. j of sacch. lactis and gr. v of sacch. alb. Oil of cinnamon disguises the taste to some extent. Many persons find calcium sulphide slightly laxative, sometimes after even one dose. Benefit in boils is often seen after the first dose.

LETTERS, NOTES, ETC.

WE have received from Messrs. Cadbury Brothers, Ltd., a neat package of samples of their cocoa essence, flavoured Bournville cocoa, dairy milk chocolate, and Bournville chocolate. The accompanying pamphlet gives an illustrated account of the favourable hygienic and social conditions under which these preparations are made and packed in the Garden Factory at Bournville.

UNMARRIED HOSPITAL RESIDENTS.

"REFORMER" writes: I notice that since the war there is again springing up, in advertising resident hospital posts, the practice of specifying "unmarried." Everyone knows that in hospital posts the residents must live in as single men, therefore I take it that this type of advertisement means a man unmarried in the legal sense. It is this point to which I wish to draw attention, as I consider the regulation a very iniquitous one. What concern is it of any committee whether a resident possesses a wife or not? It cannot be argued that a married man is likely to be less efficient and whole-hearted in his service than one unmarried. Very often the latter have distractions far less desirable than those of the former. I speak from experience, as, though I did ultimately get several resident posts in good hospitals I was barred through marriage from others. I think this condition of affairs is a scandal and calls for reform. Apart from the moral aspect of the question, it means that many men who joined the Forces immediately on qualification cannot now get the experience which they must need to turn them into properly educated medical men.

OBSTETRICAL RARITIES.

DR. D. S. RICHMOND (Johnstone, Renfrewshire) writes, with reference to Dr. Gilbertson's memorandum on expulsion of full-term fetus with unruptured membranes (BRITISH MEDICAL JOURNAL, October 23rd, p. 630): I had an experience much similar about eight years ago. I was called to a 3-para, and just as I entered the room the child was expelled with membranes intact. I ruptured the membranes; the child, a girl, 7½ lb., was, and still is, alive. Last week I delivered two primiparae. The first was a case of breech presentation; the child, a female, had a small, very imperfect skull with an encephalocele. It lived nine days. The next primipara was seen two days after. This was an occipital presentation; the child, a male, had spina bifida, with meningo-myelocele; the child was dead.

PARACENTESIS ABDOMINIS.

DR. CHARLES C. ELLIOTT (Capetown) writes: I should like to know whether the number of tappings in the following case approaches a record. About nine years ago a lady of 50 was found at operation to have large soft growths of the ovary and peritoneum, reported by the Government pathologist to be non-malignant. Since then she has been tapped at gradually diminishing intervals until now she is relieved every week; the amount drawn off is about 18 pints. Up to August she had been tapped 397 times, and the process still continues.

HOLDING THE DOOR AJAR.

WE know how jealously the French Legislature closes the portals of the medical profession to foreigners, and we note that this policy tends to be more strictly enforced as time goes by. Circumstances, however, have proved too strong in respect of German-qualified practitioners in the newly recovered provinces. After a good deal of hesitation the French Government has decided to introduce a bill authorizing medical men practising in Alsace and Lorraine to continue to follow their profession in spite of their non-compliance with the law restricting the practice of medicine to the possessors of a French university diploma. It is, indeed, difficult to see what else could be done except, perhaps, to insist upon their passing nominal examinations in a French faculty of medicine, but that would have been as illegal as the recognition of the German diploma. The benefit of the law, however, only extends to such as have applied for "reintegration of nationality," which amounts to saying, "Be one of us or go your way."

BRITISH RESEARCH CHEMICALS.

THE Association of British Chemical Manufacturers (166, Piccadilly, W.1) has issued a pamphlet giving a list of the research chemicals now manufactured or supplied by a group of twenty-one British firms. We observe that a good many of the compounds are used for therapeutic purposes. An appendix gives a list of further chemicals which members of the association are prepared to make if there is sufficient demand. It is stated that the pamphlet has been compiled at the request of the Chemical Society and the Institute of Chemistry, acting on behalf of research chemists. Revised lists will be issued from time to time.

ERRATUM.

THERE was an obvious slip in the last issue of the JOURNAL (p. 634). In the footnote to the review of the new Year Book of the Learned World, *Athena*, the publishers were stated to be "A. and C. Blake, Ltd." This should, of course, be A. and C. Black, Ltd.

VACANCIES.

NOTIFICATIONS of offices vacant in universities, medical colleges, and of vacant resident and other appointments at hospitals, will be found at pages 40, 43, 44, 45, 46, and 47 of our advertisement columns, and advertisements as to partnerships, assistantships, and locum tenencies at pages 41, 42, and 43.

THE appointments of certifying factory surgeons at Aberystwyth (Cardigan) and Bathgate (Linlithgow) are vacant.

SCALE OF CHARGES FOR ADVERTISEMENTS IN THE BRITISH MEDICAL JOURNAL.

	£	s.	d.
Six lines and under	0	7	6
Each additional line...	0	1	3
Whole single column	6	0	0
Whole page	16	0	0

An average line contains six words.

All remittances by Post Office Orders must be made payable to the British Medical Association at the General Post Office, London. No responsibility will be accepted for any such remittance not so safeguarded.

Advertisements should be delivered, addressed to the Manager, 429, Strand, London, not later than the first post on Tuesday morning preceding publication, and, if not paid for at the time, should be accompanied by a reference.

NOTE.—It is against the rules of the Post Office to receive *poste restante* letters addressed either in initials or numbers.